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CONTENTS.

ILLUSTRATIONS: Page.

Pennsylvania Co.'s Standard Passenger Engine, Class A 174
Standard Stock Car, Atchison, Topeka & Santa Fe R.R. 169
Hibbert's Grain Car Door 168
Hibbert's Continuous Draw-Bar for Freight Cars 170
Portable Rope Hoisting Machine 173

COMMUNICATIONS:

Passenger Car Painting 172
Four-Wheel Cars and Four-Wheel Trucks 170

EDITORIALS:

Railroad Accidents 176
Car Warming and Ventilation 177
Hot Journal-Boxes 177

MISCELLANEOUS:

The Outside Painting of Passenger Cars 167
Shop Notes 176
Swedish Railways 172
Relative Strength of Woods 168
Some New Passenger Coaches 168
A New Passenger Station 167
Death of Mr. Enos Varney 178
Continuous Draw Bar Patents 178

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	PAGE.
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Westinghouse Air Brake Co., Pittsburgh, Pa	v
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Midvale Steel Works, Phila	ix
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Hoopes & Townsend, Philadelphia, Pa	ix
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Erie Car Works, Erie, Pa	iv
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Harrisburg Car Mfg. Co., Harrisburg, Pa	xviii
J. M. Jones & Co., Schenectady, N. Y	viii
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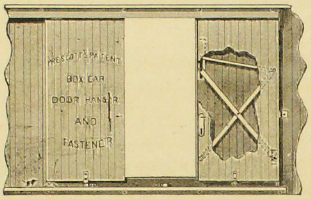

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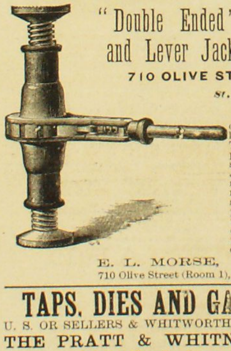

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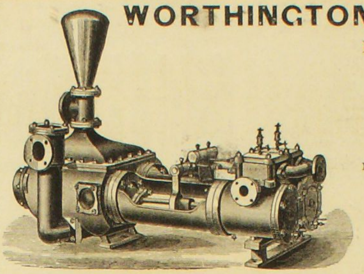

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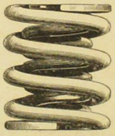

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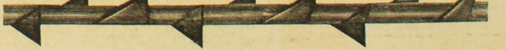

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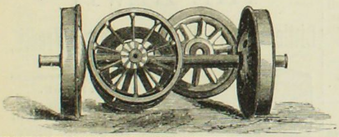

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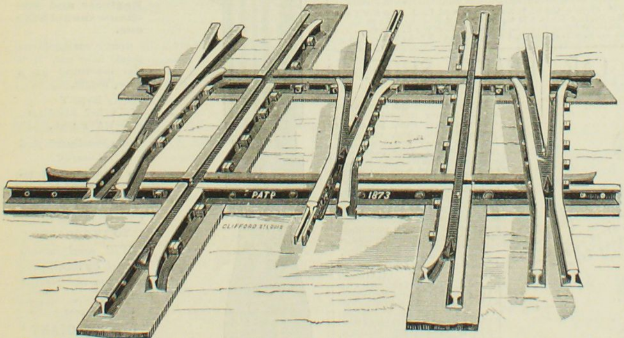

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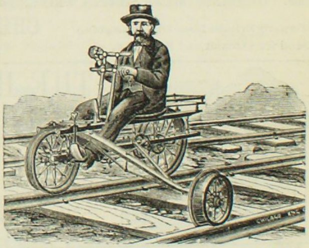

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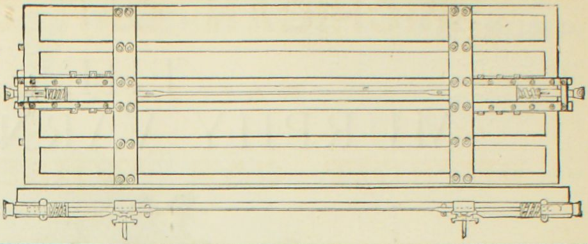

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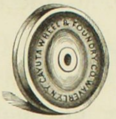

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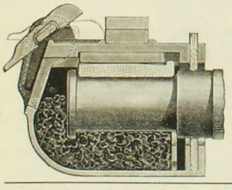

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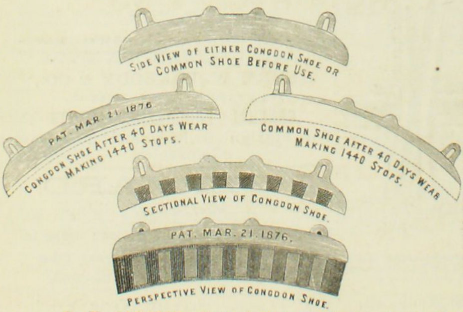

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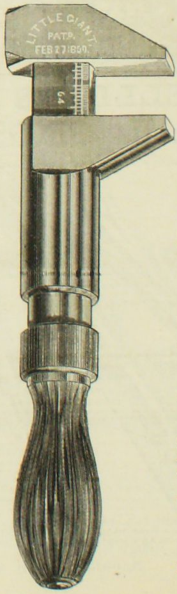

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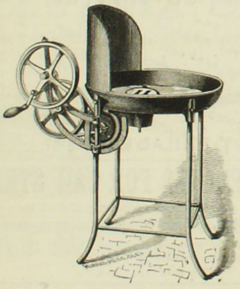

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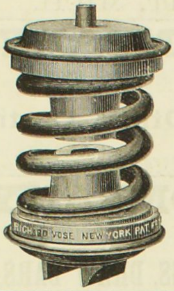
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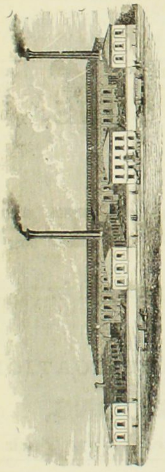

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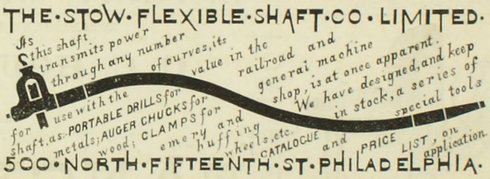

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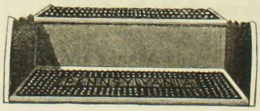

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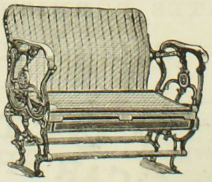

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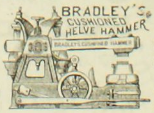

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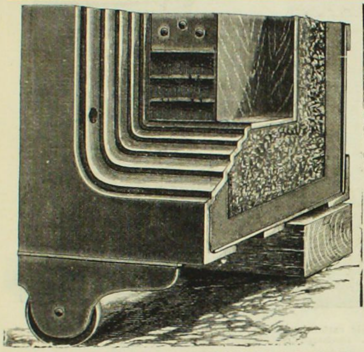

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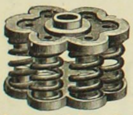

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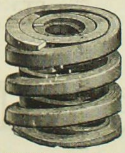

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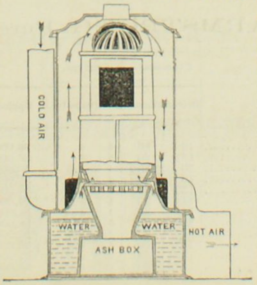

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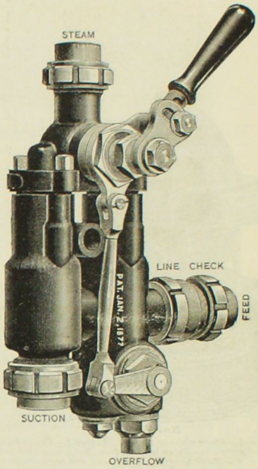

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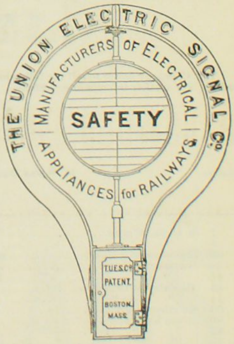
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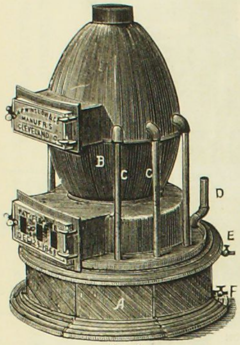

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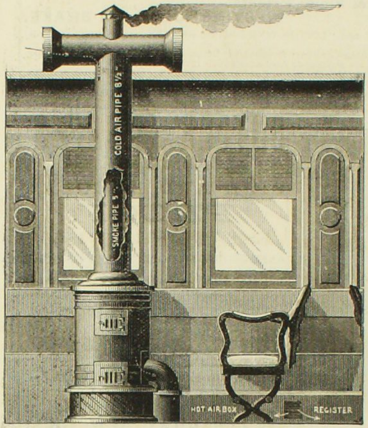

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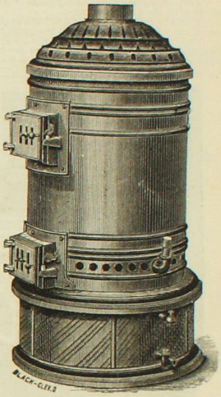

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8	" "	12½	20	4	4.	36,000	36,000	"	"	1½	"	1,500.00
25	Amoskeag	13	20	4	4.6	50,000	28,000	Coal	Iron....	1½	"	3.000.00
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41	"	15	22	4	4.10	57,000	35,000	"	"	1¾	"	2,700.00
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44	" "	14	20	4	4.6	54,000	32,000	"	"	2¾	"	3,000.00
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82	" "	15	22	4	5.6	56,000	34,000	"	"	1½	"	2,500.00
85	" "	15	22	4	4.6	57,000	35,000	Coal	Iron....	1½	Elevated	3,000.00
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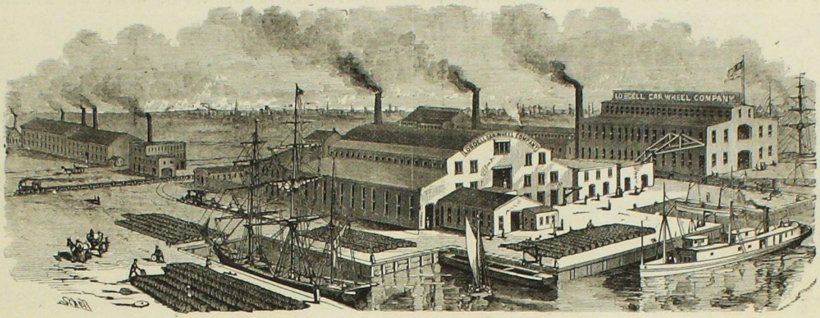
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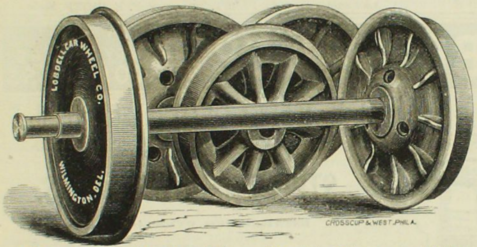
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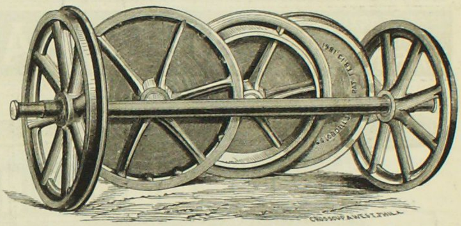
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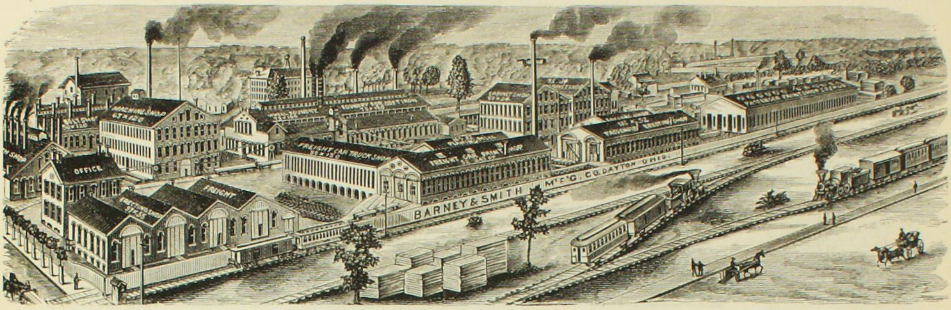
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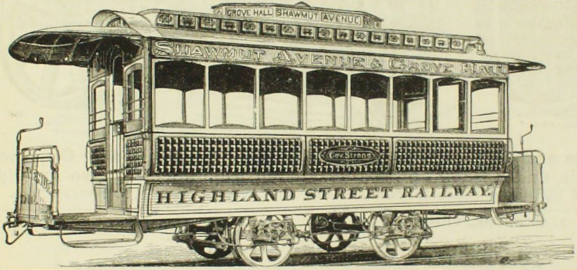
MANUFACTURERS OF
RAILWAY CAR
VARNISHES

JOHN BABCOCK & Co

NO. 2
LIBERTY SQUARE
BOSTON, MASS



J. M. JONES & CO., SCHENECTADY, N. Y.,

MANUFACTURERS OF

STREET RAILWAY CARS.

ESTABLISHED OVER 40 YEARS.

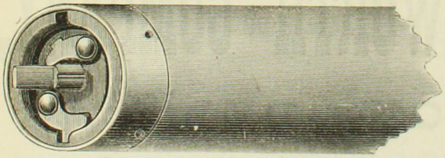
OUR CARS HAVE

ALL LATE and VALUABLE IMPROVEMENTS,

Are noted for Light Running and Easy Riding, Combining Lightness and Strength with Beauty in Design and Finish. Our Large Facilities enable us to Fill Orders Quickly, and at the Lowest Prices for Superior Quality.

HARTSHORN'S SELF-ACTING SHADE ROLLERS.

This cut shows the Roller end with the pawls attached, as it appears when not in motion.



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SOLD ALL OVER THE WORLD.

SPECIALLY ADAPTED TO

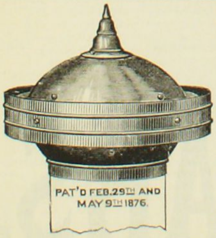
Railway Cars and Road Carriages.

Carry Shades of any Size or Weight. Do not get out of order.

ALL ROLLERS WARRANTED.

USED ON MANY OF THE PRINCIPAL RAILROADS THROUGH THE COUNTRY. MODELS AND CIRCULARS FREE.

S. HARTSHORN, 486 Broadway, N.Y.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WATER CLOSETS.
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FOR
PREVENTING DUST OR CINDERS FROM ENTERING CARS.

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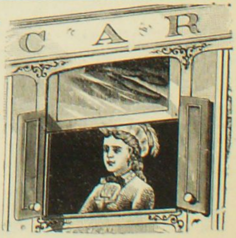
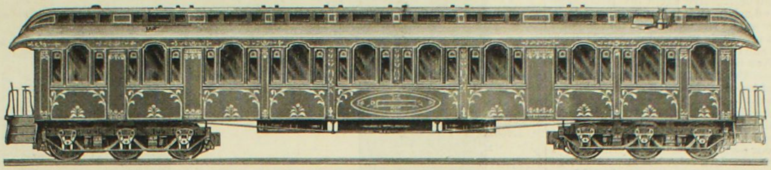
Catalogue and Price-List Furnished on Application.



THE NATIONAL CAR-BUILDER.



DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

VOLUME XI. }
NUMBER 11. }

NOVEMBER, 1880.

{ SINGLE NUMBERS, TEN CENTS
{ $1.00 PER ANNUM.

A New Passenger Station.

The Boston & Albany Railroad Company is about to construct a new passenger depot in Boston, which will have a frontage on Kneeland street of 118½ ft., will be three stories high and will have a large head and train-house. On the front, or Kneeland street end of the building, will be a fourth street. The walls will be of brick, with trimmings of granite, which will give the exterior a handsome as well as substantial appearance. On the ground or first floor, entered by two large archways (with four entrances each) from Kneeland street, will be the central court or main depot room, 42 ft. wide, and extending the entire length of the head-house. The floor will be of colored marble, and above, at a height of 40 ft., are large skylights, which will furnish ample light to the room and the corridors leading to the upper stories. A portion of this room will be finished off to the same height as the first floor, while the balance will be finished up to the line of the third story floor.

Between the two arches referred to above, and handsomely fitted up, will be the telegraph office, while leading off from the right to the large rotunda just beyond the main entrance will be the ladies' reception-room, 74 by 34 ft. in dimensions. Lavatories, a retiring-room, an extensive parcel-room, as well as entrances to the train-house and to Lincoln street, will be the adjuncts of this apartment. A window of the ticket office, which extends well out into the central court, will also be one of the conveniences, affording an opportunity to ladies to secure their tickets without being jostled or experiencing the annoyances attendant upon purchasing a ticket from outside.

The gentlemen's room will be directly opposite, and a door just north of it will open into the corridor leading to the upper stories. The gentlemen's room will be considerably smaller than that for the ladies, but still well fitted and provided with every requisite. In connection with it will be a restaurant which will front and open prominently on the central court, and out of it will be three large entrances to the train-house. Ample provisions will also be made for a news-stand. The grand staircase to the upper stories and offices will lead up from the northern end of the central hall, while at the other end will be a private one for the use of the officers of the company and their assistants. The rooms on the first floor as well as the offices will be heated by steam, and in nearly all of the apartments there will also be open fire-places, both to furnish extra heat and to assist in ventilation.

The second floor will be arranged very similar to that in the Lowell station. A broad corridor will lead around the interior and command a full view of the central court below. On the Kneeland street end will be located the rooms for the president and directors, together with the treasurer's and superintendent's offices. The president's room, through a private ante-room and a large drawing-room, will communicate with the superintendent's room, and there will also be connection with the company's telegraph office on this same floor. The several rooms for the paymaster, cashier and season ticket agent will be on the Utica street side, while the general freight agent will have quarters on the other side, and there will be several commodious apartments for the other departments.

On the floor above, or the third story, will be rooms for corporation meetings, a large library and various apartments to be used in connection with the several departments. This floor forms the ceiling for the central court below, and its rib woodwork, together with all the wood-work of the central court, including the piers, columns, balcony and carved work, will be entirely of butternut, presenting an elegant finish. This same wood will also be used in finishing the offices, and throughout the entire structure the finish will be of natural wood colors.

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The Outside Painting of Passenger Coaches.

At the recent meeting of the Master Car-Painter's Association, at St. Louis, Mr. Wm. Davis, of the Canada Southern road, read a paper on the comparative economy and durability of light and dark colors for the outside painting of passenger cars. Referring to certain experiments he had made during the past two years, he said :

You will see by referring to the report, that I spoke of some five samples which I had tested, both light and dark colors ; the first of these, a yellow, was composed of orange chrome, golden ochre and tub lead, the orange chrome and golden ochre being ground in japan and the lead in oil ; this color I thinned mainly with turpentine, using a small portion of raw oil, sufficient to allow of the color working easily and not flatting too quick, say about half a pint of oil to seven pounds of color. The second color (yellow) was composed of lemon chrome, golden ochre and flake white ; these colors were ground in oil, not in japan ; this I thinned with one part raw oil, two parts turpentine and two parts japan. In other words, I took a five-gallon tin, into which I put one gallon raw oil, two gallons turpentine and two gallons japan, or one-fifth raw oil, two-fifths turpentine and two-fifths japan. You will note the difference, both in the colors, and in the mixtures used in thinning them, as the one was principally ground in japan and mixed with turpentine, while the other was ground in oil and mixed with the different proportions as given above ; also that orange chrome was used in the one and lemon chrome in the other.

The dark colors being composed of golden ochre and burnt umber in the proportion of five pounds of ochre to seven pounds of umber ; these colors were ground the same as the yellow ; that is- one ground in japan and the other in oil, these being mixed the same as the yellows. Those ground in japan being mixed with turpentine and a small portion of oil, while those ground in oil were mixed the same as the light yellow. The Munich lake sample, I may state, I glazed with one part raw oil and two parts turpentine, there being sufficient drier in the color to dry it. Now, as you will remember, I gave the preference to the light color that had been ground in oil ; then to the dark yellow ground in japan, then in turn to the dark umber color ground in oil, and so on. The reason why the light yellow stood better than the other colors—the oil or the lemon chrome—was, in my opinion, because the oil was most effective, while the lighter color helped it, while, on the other hand, the dark yellow was affected by the japan and the orange chrome, as that color while changing seemed to lose all the effects of the orange chrome, and show more of the golden ochre. Yet both of the yellows stood much better than the dark umber colors, the failure of which I believe was due to the fact of umber not being a very durable color, and also to the use of too much japan. As regards the experiments of the past year, they were made with the same samples, with the addition of three others, a light-green, gray and light drab. But as it will require some time longer to test the three last, I need not mention them at present, but confine myself to the others. Now as the five samples have been exposed for eighteen months, I think that will be a fair test, and, as I before stated, I still give the preference to the light yellow, that having a better body, and the varnish being better than on any of the other samples, while the varnish has entirely perished on the dark umber color. You can easily see the different effects by examining the different colors through a microscope ; at any rate those colors ground in japan, whether light or dark, have not stood so well as those ground in oil, although both the yellows have stood better than the dark colors

There is also another reason. While all light colors reflect the light and heat, all dark colors absorb it ; let any one place his hand on a dark-colored body and then on a light-colored body on a warm day, and he will immediately notice the difference, the dark-colored body being much hotter. This leads me to the remarks made by "F." in a recent publication ; he says the dark colors are quite as economical and durable as the light colors. Now, as he uses umber principally, I must differ with him, as I believe umber, whether burnt or raw, to be one of the least durable pigments in use for large bodies, and as for being a solid opaque color, I cannot agree with him at all. I think there are some of you present who can speak from knowledge on the subject, having used it for some time, and as for the expense in the cost of painting, whether light or dark colors, I think there is very little difference, if any. I think it would result in favor of the light color. But where the economy is in the durability of color, that which will resist the action of light and heat longest, and will also afford a better protection to the wood, must be the most durable and least expense to maintain in the long run. If light colors will do this, it stands to reason that the light colors are the best adapted to railway coaches. The less pigments there are in any compound of colors, the better it will stand, but as Master Painters have not all to say in the matter, they have to do the best they can.

But there are other arguments in favor of light colors, as against the dark ones ; for instance, it is necessary to be more particular in the surfacing process, as every defect and imperfection, both in painting and the woodwork, shows to a greater extent on the dark, than it does on the light surface ; and, as I before stated, the varnish will perish much quicker on the dark-colored surface, owing, I have no doubt, to the action of light and heat, as well as to the pigments used, as some are of a more porous and spongy nature than others, absorbing the varnish much more readily, and under the circumstances, ought to be re-varnished not less than every six months ; on the other hand, the light yellows can easily run twelve months if properly washed. I have also noticed how much better the varnish has stood on the ornamental work of our coaches, when they were painted a dark color and the ornaments done in light yellow or gold color ; then again, some argue in favor of the dark colors, because they do not show the dirt, cinders or ashes so bad as the light colors do. I claim that there is no more destructive agent to paint than dirt, cinders and ashes, and, in my opinion, dark-colored coaches are let run too long on that account until the paint is entirely gone and the wood has become decayed and rotten, necessitating the rebuilding of the coach on the outside; on the other hand the light colors show the dirt more readily, and hence the necessity of keeping the coach clean, which I claim is of benefit to it.

It is also claimed that the dark color is much easier touched up; I can't understand how it should be so, as I have tried both, having used the dark color on our own road for some years and I fail to see where the dark color has any advantage over the light color in touching up; in fact I have found it much more difficult to touch up the dark color.

Let any one try to touch up a body that has been painted a black, and been in use a few months; I think he will not fail to see the difficulty: how much more then will it be to touch up a compound of umbre and and ochre, or where there is one or two other pigments used to form a dark body? Again, the varnish will wear better on the light color than on the dark. I have noticed on dark-colored coaches, that the varnish had entirely perished on the body, while on the ornamental work which was a gold color, it stood better and was more solid. What was the cause of this? In my opinion it was simply the action of light on the colors.—*Condensed from the Coach Painter.*

Relative Strength of Woods.

An English engineer, Mr. J. C. Trautwine, has been experimenting upon the relative strength of treenails, or wooden pins, and speaking of the imperfectness and unreliability of previous tests says: "With a view to supplying this deficiency in some measure, I have recently tested several American woods, in the shape of cylindrical pins .64 of an inch, or full five-eighths of an inch, in diameter. I used one of Riehle's well-known and accurate testing machines, in connection with an iron holder, and through a cylindrical hole in which the closely fitting wooden pin to be tested was placed. Two specimens of each were tried. Where their difference did not exceed 10 per cent. the mean is given. Greater differences must, of course, be of frequent occurrence, even in good, sound specimens. All the specimens were fairly seasoned and without defects. The central pieces sheared off were five-eighths of an inch long. The single circular area of each pin was .322 of a square inch, and that of the two areas that were sheared at once .644 of a square inch; and since .644 by 1 .55 equals one square inch, it follows that if the results in the table be divided by 1 .55, the quotient will be the actual double shearing strength found for each pin of full five-eighths of an inch in diameter. The following table gives the results in pounds per square inch of total sheared area:

Ash	6,280
Beech	5,223
Birch	5,595
Cedar—white	1,372 to 1,519
Cedar—Central American	3,410
Cherry	2,945
Chestnut	1,535
Dogwood	6,510
Ebony	7,750
Gum	5,890
Hemlock	2,750
Hickory	6,045 to 7,285
Locust	7,176
Maple	6,355
Oak—white	4,425
Oak—live	8,480
Pine—white	2,480
Pine—yellow Northern	4,340
Pine—pellow Southern	5,735
Pine—yellow, very resinous	5,053
Poplar	4,418
Spruce	3,255
Walnut—black	4,728
Walnut—common	2,830

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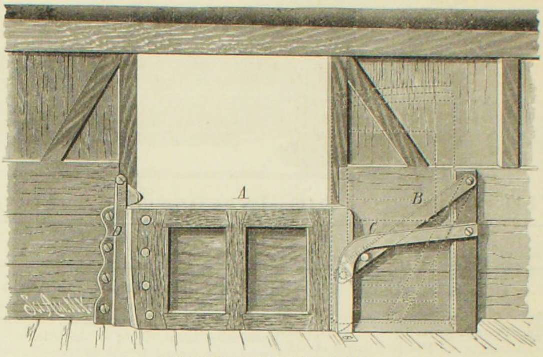
THE Lehigh Car Manufacturing Co., at Stemton, Pa., have just finished 500 coal and 200 gondola cars for the New York Central, and are now building 300 box and 200 gondolas for the Missouri Pacific. The company has built within the last 18 months, 42,000 cars of all descriptions, the most of which are 4-wheel coal cars.



HIBBERT'S GRAIN-CAR DOOR.

THE engraving is an inside view of an improved grain-car door recently patented by Mr. Thomas Hibbert, of Cochran, Ind. The invention is designed for application to ordinary box cars to adapt them to the transportation of grain. It is arranged so that it closes the lower half of the doorway when the car is to be used for grain, and swings up out of the way when the car is used for goods. The door, A, fills the lower half of the door opening, and is cut away at the free end and fitted to the flanged guard or stop, D. The opposite end of th door is pivoted to a bar, B, which, in turn, is pivoted to a post secured to the side of the car. The bar, D, carries a projecting pin, which engages a curved guide, C fastened to the vertical post and to the floor of the car. This guide keeps the door in its place and prevents it from being lifted out of its place, when closed and locked; it also protects the door against injury when the car is packed with goods.

When in use the door occupies the position shown in the engraving, and its free end is fastened by an eccentric latch at the top of the guard, D. When the door is not in use it is raised up out of the way as shown in dotted lines. It will be seen that the door can be readily applied to ordinary grain cars without any material change in their body-construction, and with small expense.

Some New Passenger Coaches.

The New York, Pennsylvania & Ohio Railway Co. have just completed at their shops in Kent, Ohio, two first-class passenger coaches, that in point of workmanship and finish will compare favorably with the productions of any car shop in the country, and are quite superior to any cars heretofore built at these shops. The bodies are 50 ft. long by 10 ft. wide over all, and will seat 62 passengers. There are 17 windows on a side, with elliptic top finish. The glass in the lower sash is 20 × 26, and in the upper sash, which is stationary, 10 × 20. There are sliding sashes in the doors to assist ventilation, and ground glass dome lights, $6\frac{1}{4}$ × 26, protected on the outside by fine wire netting. The inside finish is in solid walnut with a moderate amount of ornamentation cut in the wood, that over the windows being fluted between small columns which run up into the side lining and form a panel for every two windows, this space being partly filled with the hat racks. The cars are lighted by three double-burner dome lamps, and also have Baker heaters with pipes running under each seat. The seats are models of comfort to the traveler, the best springs are used, and the backs are shaped for each occupant so that one need not crowd the other. The upholstering is in red and green plush. The finish of the wood work is what is called an oil finish, and has a peculiar gloss, which is thought by some to be richer than varnish. The head linings are canvas, painted in warm but dark colors harmonizing with the wood work, and decorated with a great variety of broken ornament in gold and color. The effect is a near resemblance to the Japanese style which is just now so popular, and so attractive in appearance as to justify its popularity at least for the time being. The outside finish displays a moderate amount of decoration on a dark chocolate ground, which is the standard color of the passenger cars of the road. In the center of the car sides are oval panels 2 ft. wide by 6 ft. long, in which is painted the number of the car. Another car of the same class is on the stocks, but will be finished with two varieties of wood, with some slight changes in the style of the cabinet work. These cars, like the rest of the passenger stock of the road, will be equipped with Westinghouse automatic brakes. They are mounted on the standard 4-wheel trucks of the road, with $3\frac{3}{4}$ × 7 journals, and have been built under the supervision of Mr. S. V. Smith, the Master Car Builder at these shops, and reflect great credit upon his good taste and capacity both in design and workmanship. The entire cost of the two completed cars, as they stand ready for the track, is $4,850 each.

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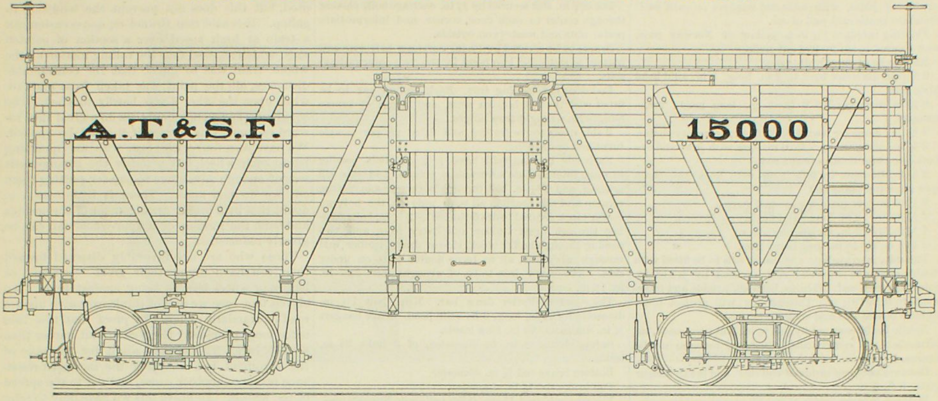
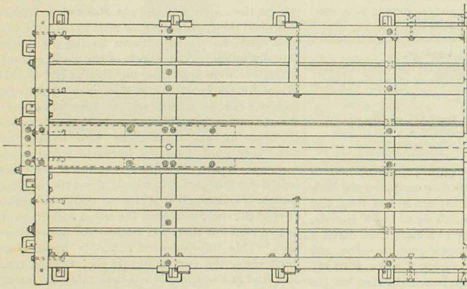
THE operations of the Chicago & Northwestern Railway car shops are more extensive at present than at any previous time in their history. There are 540 men constantly employed who turn out 8 cars per day. The works, which occupy 240 acres of ground, consume over half a million feet of lumber each month, a large number of wood working machines having been recently introduced. Thirty new caboose and 220 box cars are now being turned out, and an officer's car is being constructed which will be a model of beauty. This will contain an iron attachment at the rear of the car under the platform which will keep out the dust, and a Baker heater, with all the appliances for culinary purposes. It will be completed during the present month. Ten first-class 50 ft. coaches are also being made to be fitted up with all the latest patents to prevent accidents. They will be upholstered with seat springs and other auxiliaries to comfort and convenience. The works use 60,000 lbs. of castings, 200,000 lbs. of bar iron, 50,000 lbs. of sheet steel and 20,000 lbs. of sheet iron each month. Twenty locomotives are being constructed, 17 × 24 cylinder, for freight purposes.

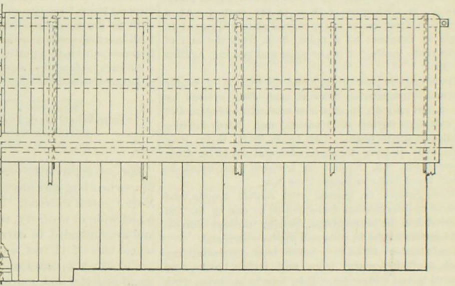
STANDARD STOCK CAR OF THE ATCHISON, TOPEKA & SANTA FE RAILROAD.



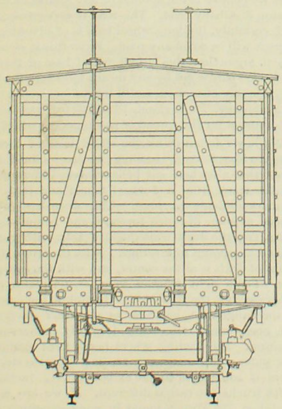
Side Elevation.



Floor Frame.



Floor and Roof.



End Elevation.

DIMENSIONS AND SPECIFICATIONS.

Total length of car, 30 ft. Total width of car, 8 ft. 6 in. Total height of car from under side of sill to top plate, 7 ft. 9¾ in.

2 clear white oak outside sills 4¾x7¾ in. by 29 ft. 3½ in. long.

2 yellow or Norway pine intermediate sills 4¾x7¾ in. by 29 ft. 3½ in. long.

2 clear white oak center sills 4¾x7¾ in. by 29 ft. 3½ in. long.

2 clear white oak end sills 5¾x7¾ in. by 9 ft. 4 in. long.

4 clear white oak draft timbers 4½x7½ in. by 7 ft. 6 in. long.

2 clear white oak needle beams 4x7½ in. by 8 ft. 6 in. long.

4 clear white oak brake hanger blocks 4x7¾ in. by 1 ft. 10 in. long.

2 clear white oak buffer blocks 5¾x8 in. by 2 ft. long.

2 yellow or Norway pine side plates 3½x6 in. by 31 ft. 2½ in. long.

2 white oak end plates 3½x11 in. by 8 ft. 9 in. long.

24 white oak posts 3½x5 in. at bottom by 3½x3½ at top by 7 ft. 5½ in. long.

12 white oak braces 2x5½ in.

4 white oak braces 2x4½in.

8 white oak carlins 1¾x9 in. by 8 ft. 9 in. long.

3 white oak ribs 1¾x4 in. by 30 ft. 5 in. long.

Running board 2x12 in. by 30 ft. 9 in. long, pine.

2 pieces side door sills supported by iron brackets. See plan.

4 pieces oak slats 1x12 in. by 12 ft. 9 in. long.

28 oak slats 1x5½ in. by 12 ft. 9 in. long.

2 pieces oak slats 1x12 in. by 8 ft. 4 in. long.

14 oak slats 1x5½ in. by 8 ft. 4 in. long.

8 pine slates 1x4 in. by 12 ft. 9 in. long.

4 pine slates 1x4 in. by 8 ft. 4 in. long.

2 oak cattle bars 1¾x7 in. by 6 ft. 4 in. long.

2 2x5 in. at bottom and 2x3½ in. at top by 7 ft. 5½ in. long oak lap studs.

Transom ⅞x6 in. by 8 ft. 6 in. long, top iron transom plates, with ⅞x1¼ in. lip welded on each end to receive lower plate, bottom plate ⅞x6 in.

2 ¼x4 in. by 15 in. long, buffer plate.

2 ¾x2½ in. by 2 ft. 9½ in. long, brake lever.

2 1¼ in. top by 1½ in. bottom, with collar 11 ft. 1 in. long, brake staffs.

4 ⅝x2 ft. 1½ in. long rods, brake girth rods.

6 ⅝x9 ft. 3 in. long rods, nuts on each end ; carlin rods.

16 ¾x7 ft. 10¾ in. long rods, nuts on each end ; body side rods.

4 ¾x8 ft. 3¾ in. long rods, nuts on each end ; end rods.

10 ¾x17½ in. long, ladder steps.

2 ½x1½ in. steps, per plan.

8 ¼x3 in. by 23 in. long, facing on each side of end door post, per plan.

4 ¼x3 in. by 12 in. long, facing on each side of corner post, per plan.

4 ⅝x2 in. by 18 in. long, strap hinges for end door, per plan.

2 1⅛ in. diameter, 31 ft. 8 in. long, 1¼ in. ends, truss rods.

2 1⅛ in. diameter, 30 ft. 8 in. long, 1¼ in. ends, truss rods.

There will be 6 ⅝ in. tie rods, extending from out to out of side plates, even with the bottom of the carlins ; 2 close to the inside of the end plates ; 2 at the second carlins, and 2 at the middle carlins; all to be secured outside of plate, with nuts and washers on each end. Standard brake each end of car.

Flooring rabbited 1¾ inch yellow or Norway pine, well secured to sill by 20d cut nails.

Roof to be of clear white pine.

2 1¾ in. diameter by 2 ft. 2 in. long, 3 in. solid head king bolt.

8 ⅜ in. diameter by 2 ft. 1 in. long inside brake hangers.

8 ½ in. diameter two links 2 ft. inside safety chains.

2 ⅞ in. diameter by 7 ft. 6 in. long with jaw and eye bolt (per plan) bottom brake rod.

2 ¾ in. diameter by 9 ft. long with hook and chain (per plan) top brake rod.

2 ⅝x3 in. (per plan) brake staff steps.

2 ⅝ in. by 18 in. long hand holds.

4 ⅝ in. by 18 in. long ladder steps.

2 1x4 in. by 18 in. long carry iron.

The side, intermediate and center sills to be fitted with double tenons to enter end sills, secured by ¾x13 in. joint bolt each end. Distance between outside and intermediate sills, 19¼ in. The end sills will project 5 in. outside of side sills and ends champered.

Needle beams secured by one ⅝ in. bolt to outside, intermediate and center sills. Distance between needle beams, 5 ft. ½ in.

Distance between inside of end sills and brake hanger girth, 8 ft. 5 in.

Distance between inside of end sill to center of transom, 4 ft. 2½ in.

The distance between upper and lower transom plates to be 5¾ in. for a space of 18 in. in the center. At a point 9 in. from center lower edge of plate will run at an angle to intersect at a point 5 in. from the end of upper plate, resting on upper plate and bearing against the lip.

Truss rods to pass through end sill outside of center sills and through buffer block at each end, secured by 1¼ in. nut and 4¼ in. cast iron washer, resting on 4x4 in. oak block on top of transom, and fitted to iron saddles on needle beam. Two 1⅛ in. 30 ft. 8 in. long truss rods passing through each end sill 10 in. from inside of side sill, resting on transom and fitted to needle beams same as center truss rods.

Brake girths to be framed with double tenons and secured to intermediate and side sills by one ⅝ in. rod grooved into the brake girths, passing through outside and intermediate sills, nuts and washers each end.

Draft timbers fitted to receive iron transoms, key block, draft lugs, carry irons and buffer blocks, and secured to end and center sills by four ⅞ in. bolts, each draft lug secured to draft timber by three ¾ inch bolts.

Center plates to be secured to the transom by 4 ¾ in. bolts passing through center sills, draft timbers, transoms and center plates; nuts on under side of center plate.

2 side doors, each 6 ft. 9 in. high by 5 ft. ½ in. wide. Six slats, ⅞x5½ in. by 5 ft. 9½ in. long. Bottom rail 1¾x9 in.; top rail 1¾x5½ in. by 6 ft. 9 in. long. Two horizontal bars 2x5 in., halved on to door stiles, secured by four 2 in. No. 18 screws. Two stiles 1¾x5½ in. Tenons on top and bottom rail, 2½ in. long, and secured by ½x9 in. joint bolts in each corner. Slats let in top and bottom rails 1½ in. flush, with inside face secured each end by 3 1½ in. No. 14 screws, and to each horizontal bar by 4 1¾ in. No. 16 screws.

2 side door sills, fitted and supported by 3 iron brackets (as per plan).

Posts fitted to stake pockets, with shoulder on front edge resting on pocket, to be 3½x5 in. at bottom, and tapered to 3½ inches at top, with 1⅛x1½ in. long, tenon, to enter center of plate. Intermediate and door posts to be grooved to receive ¾ in. iron rod, rods passing from top of plate to under side of pocket; nuts and washers on each end. Distance from inside of end sill to center of pocket, 5 in.; distance between door posts, 5 ft.; distance from inside of end sill to center of pocket, over transom, 4 ft. 5¼ in. The intermediate posts will be in center of door and transom posts. Two pockets on each sill, each 10¼ in. from outside of side sill to center of pockets.

Distance between intermediate posts, 2 ft. 3 in.; pockets secured to sill by ¾ in. stirrup, as per sample or drawing. ¾ in. rod on each corner, passing through plate and end sill; nuts and washers on each end.

The bottom slat fitted 1 in. from the floor, and secured by 2 ½ in. carriage bolts in each door, corner and intermediate posts; nuts and washers on outside.

The 5¾ in. slat secured by ½ in. carriage bolt, passing through center to each door, corner and intermediate posts; nuts and washers on outside.

Braces to be secured by ½ in. carriage bolt top and bottom to slats, and two bolts in the two intermediate slats.

End door for loading iron. Each end of car to be fitted with the two bottom slats, and angle of braces hung with wrought iron hinges.

2 side doors to be framed and fitted as per sample furnished or drawing.

Each side bearing will have 1 ¾ in. bolt passing through intermediate sill transom column and side sill bearing, and 1 ¾ in. bolt through both transom plates, column and side bearing, all with nuts on the bottom. Buffer block secured to draft timber by 2 ⅞ in. bolts passing through draft timber and carry iron, and two passing through buffer block, side of draft timber and through carry iron, all to have double nuts on under side. The carry iron to be of wrought iron 1x4 in. by 18 in. long.

The standard Potter draw bar. King bolt 1¾ in. diameter by 26 in. long, 3 in. solid head. Brake hangers ⅞ in. diameter, 25 in. long inside.

Safety chains ½ in. in diameter, of 2 links 24 in. inside.

Bottom brake rod ⅞ in. diameter.

Top brake rod ¾ in. diameter.

Flooring rabbited 1¾ in. thick yellow or Norway pine, well secured to sills by 20d cut nails.

Each car to have 2 coats of linseed oil and "Winter's Mineral Paint," the lettering and numbering to be done with the brush, and not to be stenciled.

All mortises and tenons to be painted with Alexander's four ace paint before putting together.

All cars to stand the inspection of the superintendent of locomotive and car departments or his representative.

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Four-Wheel Cars and Four-Wheel Trucks.

BY W. E. PARTRIDGE.

For several months past quite a large number of four-wheel box cars have been running on the New York Central railroad. They are 20 feet long and 9 feet wide in the body, weigh about 11,000 pounds, and are intended to carry 10 tons. They have a wheel base of 11 feet, a continuous draw-bar, and are mostly supported on elliptic springs, with the usual pedestal and journal box. The roof has the usual running board, and, in addition, a gas pipe hand-rail. If cars of this kind can be used in England, it has been inferred that they can also be used with equal advantage in this country. If, however, their movement on the track is closely watched, they can be distinguished from other cars, even at a considerable distance, by their irregular and galloping motion. With five feet overhang at the ends, and with comparatively short springs, their motion must of necessity be quite different from that of 8-wheel cars, as is evident from the loosened iron work and other indications of hard usage. They are also said to run hard around curves, but this is to some extent an unsettled point.

A four-wheel car of this description is not only subjected to the full force of every blow caused by unevenness of track, but also to an excessive motion, which is perhaps best illustrated by a horse-car, in which the motion of the ends is preceptibly greater than at the center. When the wheels drop into a depression, the overhang ends drop further than the wheel, and to this must be added the play allowed to the springs. There being no equalizers, the motion cannot be modified. Increasing the length and action of the springs only aggravates the evil. The case is different with an eight-wheel car with its four-wheel trucks, where every motion of the wheel from inequality of track is taken up one-half before it reaches even the springs upon the swing-beam. The truck itself to a certain extent plays the part of an equalizer by reducing the amount of action which has to be taken up by the springs. In European practice very long springs are often used, but this does not prevent the tendency to gallop. It is said that Brunel on one occasion ran a train at high speed over a section of painted rails, which showed that the rolling motion of the whole train was so great, that for considerable distances, all the paint was taken from one rail, while upon the other it was hardly touched. The equalizing bar would doubtless do a great deal toward reducing this motion if it could be applied. We have seen four-wheel cars with an equalizing bar at each wheel, but whether the arrangement was of enough advantage to pay for putting them on, we do not know. There is little reason to doubt that by a proper arrangement of the springs and bars, the motion of a four-wheel car can be greatly reduced.

Those who are not favorably disposed toward their use have urged their great "spread" or length of wheel base as being against them. An eleven foot base we do not think excessive upon a road of standard gauge. In proof that this base is too long, people say these cars haul harder than 8-wheel cars. This we will admit for the sake of the argument, but we think the increased resistance is due to another cause, and not to the spread of the wheels. To prove this we have only to refer to American experience in building trucks. It will be remembered that the first trucks which were put on the engines of the old Mohawk & Hudson road, had their wheels put as near to each other as they could be placed without having the flanges actually touch. The wheels of the leading trucks of engines were kept close together as late as 1854. When Mr. Garey of the N. Y. Central first began building horse cars, the wheels were placed very close to each other. These cars had a much greater pitching motion than those now in use, and were very hard upon the horses in going around corners. When, after much opposition, Mr. Garey built a car and gave the wheels about the ordinary spread, it was found that the car could be pushed around the short curves at the shops with from one to two men less than was needed for the ordinary cars. This improvement not only lessened the draft upon the curves, but in the straight track also, and at the same time considerably diminished the pitching motion. Trucks on railways soon had to have their whole bases lengthened and this has been going on ever since. Some of our most experienced car-builders think that for passenger trucks, ten or twelve feet is not too great a spread. This we believe is the opinion of Mr. Adams of the Boston & Albany road. This road is very crooked, and, certainly, if a long wheel base is of advantage there it will be so on any road. From this it seems safe to argue that the 11-foot wheel base of these 4-wheeled cars is not by any means too long. Probably for ease of motion, a still longer one would be an advantage. In England, 18 and 20 feet has been not unusual for the spread of passenger car wheels.

While we do not think the wheel base of these cars too long for easy hauling, we are inclined to think that a 4-wheel car behaves very differently on the track from a 4-wheel truck, and that it is more difficult to haul. The draw-bars are placed at some distance forward, and behind the axles, and the draft consequently acts with considerable amount of leverage. With the truck the point of draft is at the center, and with the exception of the light friction upon center-plates or side-bearings, the truck is free to follow the guide of the flanges. A horse-car or any other 4-wheel car, goes round a curve in a decidedly cornerwise position. The leading wheel bears hard against the outer rail, while the trailing wheel is slack from it sometimes to the extent of 1½ inches. With trucks the case is different. If we are not mistaken, Mr. Forney found in some experiments which he speaks of in one of his discussions of the narrow-gauge system with Mr. Fairlie, that the

HIBBERTS' CONTINUOUS DRAW-BAR FOR FREIGHT CARS.

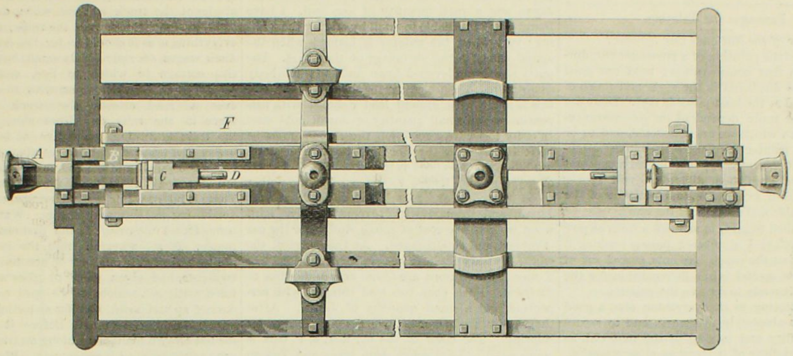

Fig. 1.

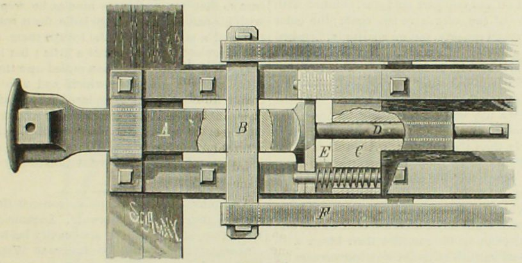

Fig. 2.

trucks of an ordinary passenger car tended to work toward the outer rail in all cases. In freight cars we have noticed that the leading wheel of the leading truck would bind harder against the outer rail than the same wheel of trailing truck. In observing freight cars stopped on the short curves of the Harlem freight depot in this city, we have, in a few instances, noticed that the trailing trucks were a little slack from the outer rail. This shows that the 4-wheel truck and the 4-wheel cars cannot be considered as identical. The car must haul much the harder of the two.

The first 4-wheel cars built by the N. Y. C. & H. R. R. seem to be decidedly light for their work, and, as a consequence, their lively motion on the track has shaken them to pieces to a considerable extent. Doubtless they have been found to be desirable for local traffic on account of their light weight and small size, but we are informed that all new ones that are built will be much stronger in their body framing, and consequently heavier.

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The *Railroad Gazette* reports the number of railway accidents for the year ending with September, as follows :

	Number of accidents.	Killed.	Injured.
October	104	35	96
November	86	16	64
December	69	18	72
January	62	11	50
February	64	16	49
March	65	9	33
April	71	11	45
May	46	30	107
June	56	15	77
July	78	21	100
August	112	49	214
September	124	15	54
Totals	937	246	961
Totals, same months 1878-79	779	200	689
Increase	158	46	272

The cuts illustrate a continuous draw-bar for freight cars, patented by Mr. Thomas Hibbert, of Cochran, Ind. Fig. 1 is a bottom view of the floor timbers of the car with the draw-bar attachments in place, one half being represented with an iron bolster and the other with a wooden one. Fig. 2 is an enlarged view, showing the position of the springs. The draw-head, A, is slotted to receive the cross-bar, B, and its inner end, D, is guided between parallel timbers, C, that extend the whole length of the car. The outer end of the draw-head is supported by a stirrup in the usual way, and the inner end passes through a follower, which is pressed outward by two spiral springs, E, which are properly supported and guided in the framework attached to the bottom of the car. The arrangement of the draw-bar is the same at each end of the car, and the two cross-bars, B, are connected by two draw-rods, F. which extend parallel with the central timbers of the car throughout its entire length. When the draught is applied by the engine, the strain is transferred through the draw-rods, F, to the rear end of each car of the train, thus relieving its frame of all stress lengthwise, owing to the yielding of the buffer springs at the rear end of the car and the abutting of the follower against the extremities of the buffer beams or blocks. In backing, the draw-heads are pressed inward, the followers pressed against the ends of the timbers, C, and the springs are pressed back into their recesses, when they are relieved of further compression.

In backing the train the inward movement of the draw-heads occurs without bending the rods, F, as the latter are slotted to admit of the movement of the cross-bar, B.

Should the rods break, the draw-heads are prevented from pulling out of the frame of the car by means of a key extending through the inner end of the heads behind the followers ; the strain is then transferred to the brackets in front of the follower.

In regard to the buffer springs, it will be noticed that but one is shown at one end of the car, and two at the other end. The design of the inventor is that either one or two springs can be used, or iron or wooden bolsters as may be preferred. In the case of wooden bolsters, the rods would go underneath, and in case iron ones are used, the rods would go between the plates. The springs, whether one or two are used, are seated in a cup or bracket 4½ inches deep, leaving 1½ inches outside the cup, which is held in its place between the draft timbers by a plate and bolts. In heavy buffing, the rear end of the draw-head would strike the rim of the spring pocket before the spring is exhausted, and thus save it from breakage. In regard to the cost of the attachment, it is claimed by the inventor that in cases where the old style of draw-bars have to be renewed, it can be applied with but little additional time and expense, which will be repaid many times over before the car is worn out. For further particulars the inventor may be addressed as above.

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The Cincinnati Railroad Co., lessee of Cincinnati Southern, will immediately purchase 500 new freight cars ; 400 of these will be first-class box cars and 100 improved stock cars. A portion of them will probably be built at the Chattanooga Car works, and the balance at the Erie Car Works and by the Ohio Falls Car Co. Twelve new and powerful engines have been ordered. The company is said to be expending a quarter of a million dollars at Chattanooga in machine-shops, roundhouse, etc. The extension is to be completed from Boyce to Chattanooga this season.

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The automatic Westinghouse brake has been fitted on 456 English engines and 2,942 cars ; in France on 203 engines and 1,609 cars ; in Belgium on 197 engines and 1,241 cars ; in Germany on 55 engines and 93 cars ; in Russia on 36 engines and 51 cars ; in Holland on 28 engines and 117 cars ; in New South Wales government lines on 23 engines and 18 cars. In the United States it is used by 130 railways on 2,211 engines and 7,224 cars. With a few on the lines of several other countries, the totals are 3,277 and 13,502, while the non-automatic system is fitted out on 2,472 engines and 8,812 cars.

Communication.

Passenger Car Painting.

To the Editor of the National Car-Builder:

In regard to the painting of a passenger car, durability is the first consideration; next our good taste must be displayed in the style and finish of the work, and at the least possible cost. There are few vocations more dependent on circumstances than that with which we are connected, and to be a successful painter it requires the closest attention, the most thorough application and a constant watching, and, even then, difficulties will appear baffling the skill, experience, and patience of the most practicable and amiable of the craft.

Allow me then to give, in as brief a form as possible, the method I at present pursue; taking it for granted that the coach has now passed out of the erecting shop and is in a fit condition for the painter, and is ready to receive the priming.

Now in painting, as in everything else, a good foundation is absolutely necessary, and to secure this, the quality and mixing of the material, as well as the handling of it, demand close attention.

Some regard the priming as a simple matter, and for economy put it into the hands of an inexperienced or low-priced workman, and thus make a false step in starting. The object of priming is to fill the pores so as to be cohesive, and have the proper elasticity. Attempts have been made at reform, and efforts with a basis other than ground lead and oil. The so-called efforts, however, have always fallen short of the reformer's hopes, like all previous attempts at improving on the old lead and oil system, while some painters have been satisfied to adopt some novel primer, and were glad to fall back again on the lead and oil. Opportunities surely have not been denied the reformers for accomplishing their results, for they have been received with open arms by some painters and have failed. My experience as a painter is, that lead and oil is the best primer. A great deal of trouble undoubtedly arises by the lead coats being hurried on to each other without giving a sufficient time to dry, thus forming a poor surface; in fact, car painting of late years has been too much of a hurrying process, and right here let me state that great care should be taken in puttying, also in preparing the putty for the work, for good work has been spoiled by intrusting this work to inexperienced workmen, and also by experiments for hastening work and for shortening the time required for coats to dry, but never yet without imperiling the durability of the work, for as you shorten the drying, you shorten the wear of the car and endanger your success. So thoroughly is this fact grounded in the experience of painters, and so universally is its truth established, that to speak to a painter of a quickly-finished job is to invite him to regard it as short-lived. In submitting my plan of painting and finishing the outside body of a first-class passenger car, I shall present it in as few words as possible. Allow me to state that I use lead and raw oil. For a priming for the oil I take one gallon of raw oil and put one pound of litharge into it, and shake three or four times a day; after a few days allow it to settle, and then strain it; this improves its drying properties and frees it from grease. I use equal parts of this oil and turpentine for this coat, and let stand five or six days, or longer if possible. Before applying the second coat, before which the priming coat is well sandpapered, the paint for the second coat is mixed with one part oil and three parts turpentine, adding a small portion of Japan, using the same care in spreading the color and filling the nail holes as on previous coat. This coat I let stand four or five days, and longer if possible, before puttying. The work is now ready for puttying; I prefer puttying after the second coat, as the holes are more likely to be filled. The hard putty I use is composed of dry lead and whiting, in equal parts mixed with Japan and a small quantity of keg lead. I have found putty less liable to swell by adding the whiting; very often the painter is blamed when the actual cause is the shrinkage of the wood. The putty now being levelled down, and the whole body sandpapered, we are ready for the third coat, and this is made with ground lead reduced with turpentine and a small quantity of Japan gold size. In order to secure a good job these coats must be perfectly dry after three or four days. The scrapping filler which is used is mixed with equal parts of keg lead and Reno's French umber, the umber to be ground in one part boiled oil, and one part Japan, and thinned with turpentine. The hard wood we give one coat of rough stuff after the car is rubbed and sandpapered. At this stage of the work, the body ought to be carefully examined and if any imperfections are found now is the time to fix them. Fifth coat, tub lead thinned with turpentine, and a small quantity of Japan. After thoroughly sandpapering, we are now ready for coloring. The color of the C., R. I. & P. cars is composed of golden ochre, drop black and Tuscan red, ground thick in four parts turpentine and one part boiled oil and one part gold size, thinned with turpentine; of the color give two coats; the color must be worked quickly, put on sparingly, brushed out well, and laid off evenly. The best brush I know for laying color is flat sable. This I recommend as the best and most economical. The car now is ready for the first coat of varnish. For the first coat we use one part rubbing and one part wearing body. I consider this preferable, as it is more elastic than the rubbing. After an interval of four days it can be rubbed preparatory to ornamenting. Supposing the car is ornamented, I have it well cleaned before applying the next coat of varnish, which is wearing body. This coat I let stand seven or eight days, then use cold water, and sponge and chamois the car, and then finish with wearing body varnish; I prefer wearing varnish for all coats. In brief, this is my formula for painting and varnishing a car, and I give it for what it is worth. I agree with a great many that rough stuff makes a fine finish, but does it pay, or does it add to durability? But to secure better results in car painting is surely a matter of vital moment to every railroad company, for of all the departments of car construction none concern more directly and vitally the reputation and success of the road. If a car is poorly painted, not only is it a discredit to painter and company in the matter of looks, but a direct and serious violation of economy in the management.

The task of painting a car properly is attended with many trials and difficulties, and no subject is more worthy the serious attention and study of railway managers. I will have something more to say on this subject hereafter.

JOHN RATTENBURY,
Master Painter C., R. I. & P. R. R.

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Swedish Railways.

A correspondent of the Providence (R. I.) *Journal* writes as follows:

"Railroads in Sweden are conducted decently and in order. There is no unseemly haste. The position of station-master is a lofty and an honorable one, much sought after and not infrequently occupied by the nobility. The station-master is an imposing individual. He wears a uniform, and when the train comes in he stands upon the platform with a bright red flag in his hand, which he waves as a signal for the train to stop. When it is near time for the train to start a bell is rung once or twice, but the train does not go for that. It is not until the station-master blows his shrill whistle and the locomotive replies that it slowly moves off. By the side of the railroad, several miles apart, little red cottages are seen. These are the abodes of the track walkers, whose duty it is to walk, at stated times, over the track, to see that everything is as it should be for the coming train. Their wages are ridiculously small, but they have this cottage in which to live, and a thrifty potato patch provides them with food. Wherever a road crosses the track two gates fence in the rails on either side, and when the train is coming, some five or ten minutes before, the track walker or a member of his family closes the gates and then no more carriages are allowed to pass till after the train has gone by. There is no ice water boy, no newspaper and book vender passing through the cars. Water is sometimes found in a *carafe* in the first class compartments. In a Norwegian train, the lamps, which are not needed in summer on account of the long twilights, had given place to glass water bottles filled with ice, which, as we sped over the rails danced up and down, rattling and clinking after a very refreshing manner. Before it had quite melted away a man came along on the top of the car and replenished it generously. We counted it a piece of luck that we happened to be out of the cars so that we could see him as he went along with his pail of ice and large ladle, for it was something of a mystery how the ice got there, and we had speculated about it not a little; but it was a very simple matter; the man pulled up a tin cover, lifted out the glass jar, which had also a glass cover, filled it with ice, replaced it carefully, and passed on. The American newsboy would find no employment here. His place is filled with old women and children, a half dozen or more appearing on the platform at every station of any size, to offer the daily news."

◆

AN innovation in locomotive construction was recently tested on the Delaware, Lackawanna & Western road. A train of six heavily loaded coal cars was attached to the locomotive at Waterville, N. Y., and, without the application of any brakes, was taken to Utica, 21 miles distant. The speed of the train was diminished and stops made on down grades of 70, 80 and 90 feet to the mile, by the use of a lever, the engineer being able, in this way, and unassisted, to control the train. The engine used is of the ordinary pattern. The power brought to bear against the piston is obtained by the use of an extra valve in the steam chest. By this steam is had direct from the boiler through a pipe which enters the steam chest where ordinarily the oil cups are placed. By this arrangement there is no need to reverse the cut-off lever, thereby obviating an immense strain upon the engine which attends the process known to railroad men as "hauling over."

◆

J. M. JONES & CO., proprietors of the Schenectady Car Works, are busy upon orders for street railway cars for various companies in the United States and Canada. They have also orders in hand from Australia. The works of the company are exceedingly well-arranged for this branch of car manufacture, the ground space being ample, and each department supplied with the best of tools, machinery, and other facilities for turning out work of the best quality and in the most expeditious manner. With the exception of wheels, axles and springs, all the details of construction are manufactured on the premises.

◆

Mr. Babbitt of the Michigan Central R. R., has invented a diagram board by which he is enabled to locate the position of all the coaches, baggage and express cars used on first-class trains. Pegs of different colors and shape designate the particular cars, and a glance at the diagram is sufficient to tell the number, kind and position of the cars on a particular train.

Portable Rope Hoisting Machine.

The engravings illustrate the quick-lifting portable rope hoisting machine, manufactured by the Philadelphia Patent Rope Hoisting Machine Co., 2208 Washington Avenue, Phila. Fig. 1 is a perspective view, and Fig. 2 shows the hoist in section.

The object of using ropes is to avoid the stretching of chains, causing them not to mesh in the sprocket wheels. In the working of a portable rope hoist, the trouble is to wind the pulling rope up without using a drum for it, and this has been overcome by using a binding wheel, as shown in the cut. It is placed over the pulling wheel, which prevents the rope from rising in the sprockets, and binds it down on the pulling wheel. The pulling wheel and gear are cast together. The hand-rope guide is so arranged as to keep three-quarters of it always on the wheel. It consists simply of two arms, one fastened to the frame, and the other placed in front of the hand-rope wheel; and two small wheels, which are placed between the two arms, and on each end, for the purpose of guiding the hand-rope and binding it into the wheel. At the bottom of the frame are placed two small wheels, between which is placed a separator. The use of one of these wheels is to make the load pull in line with the hook, placed at the top of the frame, while the other is to keep the rope from running off of the pulling wheel. The brake consists of a lever placed on an eccentric. In the cut at bottom of page, *E S* is a hardened shoe, which is so made that it can be easily removed; *N* is to prevent the brake passing the centre of the eccentric. It will be seen that if the hand-rope wheel *W*, runs in the direction of the arrow *U*, the brake will rise and allow the load to be hoisted; but as soon as the hand-rope is loosened, the wheel will run in the direction of the arrow *D*, and the brake will expand in the rim *R* of the hand-rope wheel, thus preventing the lowering of the load. By the use of pinion, gear and head-rope wheel great power is gained. The ropes cannot possibly slip or leave the wheels, at any time thus enabling it to hold a load at any point. The hook on the load rope is arranged to turn without twisting the rope. The rope used is of the best Italian hemp plaited; but should it wear out, by long use, it can, unlike Chordal's chain, be replaced by any ordinary rope. The manufacturers claim that this hoist can be put to all the uses that a chain hoist can, and that it is much lighter. The load can be lowered slowly or as quickly as a pulley block. The ropes are, of course, easier than chains on the operator's hands.

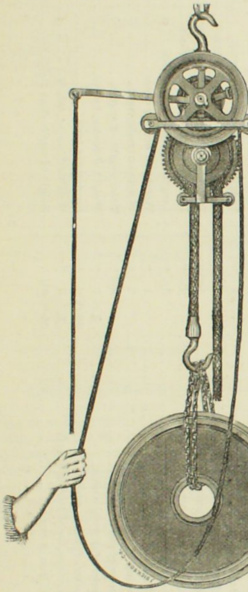

Fig. 1.

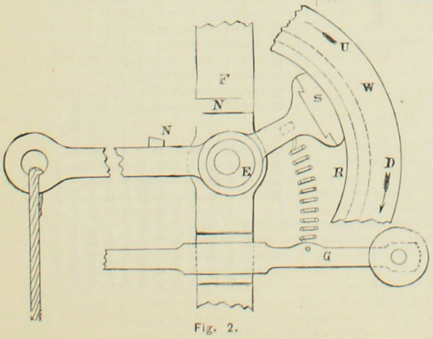

Fig. 2.

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THE passenger depot of the New York Central road, at Schenectady, is a marvel of antiquity when viewed from a modern standpoint. It is a long, narrow structure, and if one end could be sharpened a little, and the whole set upon a pedestal, pointed end up, it would fairly compete with the great imported obelisk. The ancient wood work, inside and out, is in a good state of preservation, and the benches in the waiting rooms are ornamented with home-made hieroglyphics cut with the jackknives of boys, some of whom are now grandfathers. It is a genuine fossil of the early strap-rail period, and should be carefully photographed as a curious relic of primitive railroading, before it takes fire from the engine sparks, or disappears before the rush of modern innovation.

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THE Atchison, Topeka & Santa Fe road is now completed, and cars are running to Socorro, New Mexico, a distance of 970 miles. The number of miles actually operated, including branches, is 1,176. The monthly wages of the men on the line aggregate nearly a quarter of a million of dollars, and this with the pay roll of the construction account, and officers and agents of the various departments, indicates what a power it exerts in developing the resources of that wild region. The road is not yet finished, but will be continued to the Mexican boundary, a distance of only 125 miles, where it will connect with a line extending to the City of Mexico, with an ultimate extension to Guaymas, on the Gulf of California. A large mining traffic already exists in New Mexico, and also an extensive trade in cattle, hides and wool. Topeka, Kan., is the headquarters of the company, and here are its machine shops and principal offices. Nearly all the directors live in Boston, and the road is built and operated with Boston capital.

◆

MR. JOHN RATTENBURY, the car decorator of the Chicago, Rock Island & Pacific, has designed and painted a beautiful specimen of pictorial railway advertising, which has been placed in the Chicago Exposition. It is an oil painting some 25×12 feet in size. In the four corners are represented the Chicago depots of the road, and the Kansas City and Council Bluffs depots; while in the center is shown the interior of a dining car with the utmost fidelity of detail, the panels, seats and other parts being painted in colors which correspond exactly with the originals. An excellent map of the road is also given.

◆

THE *Baltimore Sun* says that ten new passenger cars are nearly completed in the workshops of the Baltimore & Ohio, and that thirty of the new refrigerator cars are completed, and twenty more are under way. These cars are 29 feet length of body, 8 feet 4 inches in width, and 7 feet high. They weigh 25,600 pounds each, and have a carrying capacity of 40,000. Each car has two sets of doors, which keep the air out. The flooring is sandwiched with sawdust as are also the walls. At either end is an ice-box reaching from floor to ceiling, and capable of holding about 1,000 pounds of ice. The exterior is painted a bright yellow with black edgings. On each side is a large letter "R" which is an abbreviation for refrigerator, painted black within a red diamond.

◆

ALL new cars of the Louisville & Nashville road are now made to a standard pattern. The box, stock and gondola cars are 30 feet long, and flats 32 feet long. The trucks of all are exactly alike and perfectly interchangeable. The axles are of the M. C. B. standard, and the wheel seats turned sufficiently far inside the wheels to allow them to be pressed inward for the standard gauge. It is intended eventually to have but one pattern of axle and oil-box on the line. The same plan is intended to be carried out with reference to all other parts of passenger and freight cars. The total number of cars now on the line give only about 2.64 cars to the mile operated.

◆

AN exchange says that the Ohio Falls Car Company have lately commenced one of the most magnificent cars ever built in the Union. It is a combination directors' pay car and sleeping coach, and is for the Minneapolis & St. Louis Railroad. It will contain three compartments—the paymaster's, containing a burglar and fire-proof safe, the directors' room, and the sleeping coach. The choicest woods, ebony, mahogany, maple, walnut, whitewood, etc., will be used in its interior decoration, and all the latest appliances for comfort and safety will be used in it.

◆

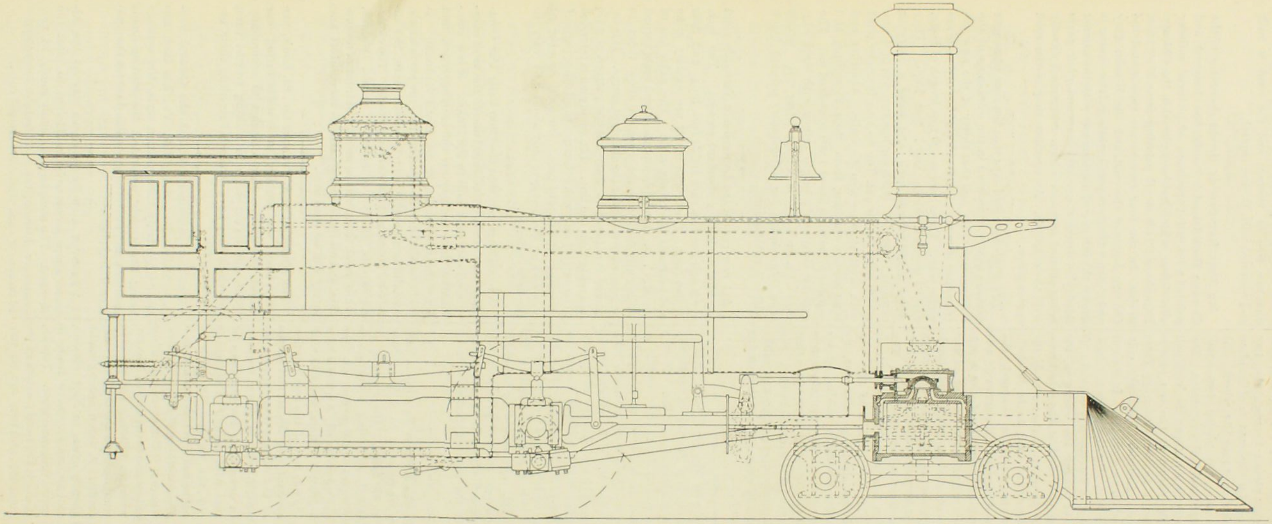
THE Missouri Car & Foundry Co., St. Louis, are very busy; the foundry in manufacturing car wheels and the necessary castings to accompany them, and the car works in making freight cars, for which they have demands exceeding their capacity to fill.

◆

THE new passenger depot of the Central Vermont Railroad, at Montpelier, Vt., has been finished up in truly metropolitan style, the ceilings being handsomely decorated, the waiting-rooms spacious, and everything possible done for the comfort of travellers.

◆

A PRODUCT of 20 freight cars a day at the Altoona shops seems to be insufficient to meet the demand. The company has built lately 23 new passenger locomotives, 65 freight locomotives 99 passenger cars, and 2,000 freight cars.



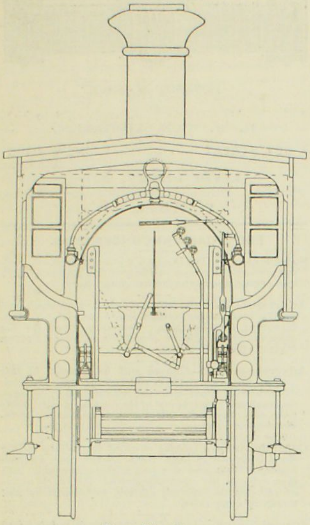
STANDARD CLASS "A" PASSENGER LOCOMOTIVE OF THE PENNSYLVANIA COMPANY.

Built at Fort Wayne, Ind., Shops.

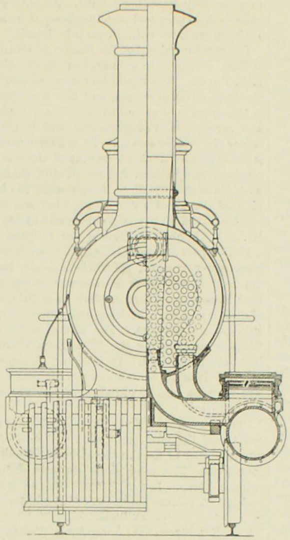
DIMENSIONS, WEIGHT, ETC.

Cylinders	17x24	in.
Outside diameter of boiler	53½	"
Thickness of steel plates	⅝	"
Number of tubes	162	
Length of tubes	11 ft. 0	in.
Outside diameter of tubes	2	"
Inside length of fire-box	72	"
Inside width of fire-box	35¾	"
Inside depth of fire-box	66	"
Square feet of grade surface	178	
Heating surface of fire box (sq. ft.)	1,158	
Heating surface of tubes "	9,326	
Total heating surface (sq. ft.)	10,484	
Diameter of cylinders	17	in.
Stroke of piston	24	"
Length of steam ports	15	"
Width of steam ports	1¼	"
Width of exhaust ports	2½	"
Travel of valve	5 3/16	"
Outside lap of valve	1	"
Inside lap of valve	0	"
Diameter of piston rod	2½	"
Diameter of driving wheels	5 ft. 0	"
Diameter of truck wheels	30 ft. 0	"
Center to center of driving wheels	8 " 9	"
Wheel base of engine	22 " 6½	"
Wheel base of engine and tender	43 ft. 7	in.
Diameter of driving axle journal	7	"
Length of driving axle journal	8	"
Length of main crank pin journal	3¾	"
Diameter of main crank pin journal	4	"
Diameter of parallel rod journals	2¾	"
Length of parallel rod journal	2¾	"
Weight on driving wheels	52,450	lbs.
Weight on truck wheels	28,960	"
Total weight of engine	81,410	"
Weight of tender, loaded	52,300	"
Capacity of tank	2,100	gal.
Weight of tender, empty	21,075	lbs.
Height of smoke stack above rail	14 ft. 10	in.

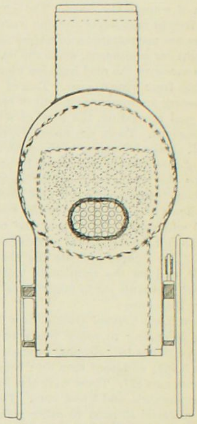
[*See cuts on opposite page.*]



Rear Elevation.



Front Elevation and Section through Cylinder.



Elevation showing Boiler and Fire-Box.

Miscellaneous Items.

MR. R. M. BRERETON, Chief Engineer of the Great Indian Peninsula Railroad, writing on locomotives, says that "the Americans certainly obtain from 8,000 to 10,000 train miles greater duty per annum than we can in this country or in India, and this, too, under the following drawbacks: Inferior road-beds, steeper gradients, sharper curves, more severe climates, heavier loads hauled and less speed in running. The greater duty obtained cannot be due to better workmanship and superior materials, because it is well-known that the English mechanic in skill of hand cannot be excelled, and the very best materials are employed by our English builders, and the hours of work in both countries are nearly the same. Hence I argue that the greater duty done by the American motor is due to the better systems of working the locomotives. The American builder excels in the system of framing and counterbalancing, and in the designs of the cranks, axles, etc., so that the engine may run remarkably easy and without jar around short curves, and work not only on the light roads, but also diminish the wear and tear on the solid roads, and at the same time increase the effective tractive force. The English engine is a very heavy affair, and, in running, it not only wears and tears itself very rapidly, but also the roadway, and it greatly, by its unsteadiness and jar, fatigues the driver and fireman.

Mr. G. B. SIMONDS, Superintendent of the Cairo & St. Louis Railroad, at East Carondelet, has had built under his plans, direction and supervision a narrow gauge locomotive engine which does him a great deal of credit. The engine weighs 24 tons, and has many new and useful features in the way of strength and originality of design. The boiler is straight, with a single dome over the center of the fire-box, and is provided with two Sellers' injectors, which are mounted inside the cab. The cab is as commodious as those of standard gauge locomotives, and is finished in polished and oiled black walnut and ash woods. The engine is of the six-wheel Mogul pattern, with a Pauley truck; the link motion is especially fine and effective. It was designed and built especially for the Cairo & St. Louis Railroad, which is very crooked and hilly. Several trips have been made with it, and the performance was perfectly satisfactory. The following are the principal dimensions: Cylinders, 14 × 22 in.; driving wheels, 45 in. diameter; tender and truck wheels, 26 in. diameter; boiler, 44 in. diameter; number of flues, 118; length, 9 ft. 4 in.; diameter, 2 in.; length of fire-box, 58 in.; height, 53 in.; width of crown sheet, 36 in.; width of grates, 19 in.; length, 58 in.; main pin, 3½ × 3½; in.; side rod main pin, 3¾ × 3 in.; front and back pins, 3 × 3 in.; axle bearings, 4⅛ × 6 in.; capacity of tender for water, 2,000 gallons; engine wheel base, 18 ft. 9 in.; ridged wheel base, 12 ft. 3 in; engine and tender wheel base, 39 ft. 6 in. All wrist pins are of steel.—*Age of Steel.*

THE Pullman Palace Car Co., in their annual statement for the fiscal year ending July 31, 1880, report a gross revenue from all sources of $2,635,468, and expenses of $955,047. The net revenues over expenses are $1,680,421, applied as follows:

Rentals of leased lines	$264,000
Interest on bonds	168,979
Dividends on capital stock	472,876
Total	$905,855
Surplus	774,560
Balance to income account last year	3,579,380
Surplus	$4.354,046

The Engineer notes the fact that during the first six months of the present year the amount paid for compensation by nine of the chief road companies in England amounted to the enormous sum of £127,000, or over £21,100 per month. The larger part of this was paid on account of personal injuries; but it is gratifying to note that the amount is less than has been paid for corresponding periods heretofore, and which is an evidence that railway traveling in England is safer than it was a few years ago. This is attributable to greater perfection in signaling and in telegraphy, and to the more general adoption of the block system.

Two new sleepers named "Rock Island" and "La Salle" have just been put on the Rock Island & Pacific road by the Pullman Company. The interiors are finished in California redwood, which is a species of mahogany, and resembles it in appearance. The new feature of these cars is, that they have four instead of six-wheel trucks, the wheel-base being the same. The wheels are 42-inch paper, and the coaches are said to run as easily as any ever built.

MR. J. D. MCILWAIN, upon his retiring from the position of Master Car Builder of the Jeffersonville, Madison & Indianapolis road, at Jeffersonville, Ind., to accept that of Assistant Superintendent of the Missouri Car & Foundry Co., of St. Louis, was presented by the employés of the car department with a handsome silver grape-dish lined with gold, as a token of their respect and esteem, and as a future reminder of the cordial relations that have so long existed between the givers and the recipient.

THERE is now running on the Iron Mountain & Southern road a flat car of new design having three sets of trucks. It is the invention of Mr. J. C. Terry, of Carondelet, and is in daily use, carrying a load of 18 tons of iron ore. The center truck is made so that it will shift when upon a curve, sometimes running far beyond the edge of the car.

THE Lehigh Car Wheel & Axle Works at Catasauqua, Pa., have completed 1,000 box cars for the New York, Lake Erie & Western, and are now at work on 300 drop-bottom coal cars for the same road.

BOWERS, DURE & CO., Wilmington, Del., are building 140 gondola cars, and six first-class passenger cars for the Shenandoah Valley road; they have also orders in hand from the East Tennessee, Virginia & Georgia, Western North Carolina and St. John & Lake Eustis (Fla.) roads. They have also just finished 3 combination smoking and baggage cars for the St. Paul & Duluth, 10 street cars for the People's Line of Baltimore, and 4 for the Philadelphia City Passenger Railway Co.

Shop Notes.

While making a flying visit recently to some of the machine and car shops in the vicinity of Albany, we found business every where active and the usual number of workmen employed. The largest of these shops are those of the New York Central road at West Albany, which cover an area of some sixty acres. The great increase in the freight business of the line within the past few years has necessitated a considerable increase in its freight car equipment, while the movement of foreign cars over the road has been increasing in magnitude from year to year. This of course renders necessary an immense amount of repairing, renewing and rebuilding, the most of which is done at these shops. There are about 17,000 freight cars of all classes belonging to the road, and the repairing of these, and of cars owned by connecting lines, keeps the whole force pretty steadily employed without turning out much new work. The following items from the record of the work done during 1879 will convey an idea of the capacity of the works and the increasing traffic of this great trunk line. The figures indicate the number of repairs made, and not the number of individual cars repaired, the same car in many cases being repaired more than once :

New York Central freight cars 21,975; freight cars belonging to other roads 40,347 ; drawing-room coaches 480 ; sleeping coaches 395 ; passenger cars 3,063 ; emigrant cars 151 ; baggage, mail and express cars 871. There were also built 115 freight, 26 conductor's, and 2 tool cars. The manufacturing material shipped to other points on the line during the year, was as follows ; 272,076 feet of lumber ; 219,461 lbs. of brass ; 366,398 lbs. wrought iron ; and 2,122,680 lbs. castings. The amount paid for labor during the year was $229,417.29, and for material $503,112.34.

One of the noticeable features of the car department is the use of improved machinery and methods for abridging hand labor, and at the same time securing greater uniformity in the iron work of trucks and car bodies. Standard forms are adopted for arch-bars, and the holes drilled by templet. Stirrups, ladder-irons, hasps, keys, washers, shop wrenches, and the like, are shaped and made complete at one motion and one heat. Angle-irons of any desirable size are cut from the bar, the bar being heated to a red heat and placed on an angular block under a press, where the pieces are cut off by a cast-iron chilled cutter, and in a far more expeditous manner than by the old method of forging.

Mr. Hoit, the Master Car Builder, has just commenced building two day passenger cars with some differences in the details of construction, the object of which is to test the comparative merits of each in practical running. The truss-planks in one of them will be placed on the outside instead of the inside of the car, and entirely hidden from view ; the floor framing will have an arched longitudinal stringer on each side centering against the side sills. There will be three spaces between the upper and under flooring, and also some peculiarities in the roof framing, an illustration of which we hope to be able to give our readers at an early day. The dimensions of these cars are 55 ft. long by 9 ft. 6in. wide in the body over all.

Some of the standard freight cars recently built for the Vanderbilt roads were standing in the track-yard. These were a stock car with a stenciled weight of 21,900 lbs ; a gondola weighing 19,900 lbs. and with a marked capacity of 40,000 lbs. ; a 4-wheel box car weighing 12,800 lbs. with carrying capacity of 22,000 lbs. ; and a 4-wheel center-dump coal car, weight 9,650 lbs. capacity 20,000 lbs. The construction of these cars is admirable in every respect, and it is safe to assume that they will be adhered to as standards by the roads under whose auspices they have been built. As we expect to publish drawings and specifications of some or all of them, we need not now go into details.

The machine shops of the Boston & Albany road, at East Albany, are in charge of Master Mechanic T. B. Purvis. The round-house accommodates upwards of 50 locomotives, and the force employed in the shops is busy with the ordinary repairs. A new car shop is in progress and will be completed before the winter sets in. It is a structure which is much needed at this terminus of the line for the repair of freight cars, and we predict that its present dimensions will be found none too large, in view of the large traffic of the road and the wear and tear incident to sharp curves and heavy grades. Mr. J. E. Doran is the Master Car Builder.

The Gilbert & Bush Co., at Troy, are busy upon passenger car work, for various roads, including the Iron Mountain & Southern, and the Flint, & Pere Marquette. These cars are beautiful specimens of design and workmanship and reflect credit upon builders and owners. The last of a lot of new Wagner sleepers for the New York Central has just been completed. In size, and in interior and exterior finish, it is about as complete and costly a structure as can be found on any of the roads in the country.

The Green Island Shops of the Delaware & Hudson Canal Co. are quite extensive and employ a large number of men in the locomotive and car departments. The work done is almost entirely repairing. Mr. J. L. Corey is the Master Mechanic, and Mr. C. Körner the Master Car Builder.

* * *

The Schenectady Locomotive Works are engaged upon orders from the Central Pacific ; Chicago, Milwaukee & St. Paul ; Cincinnati Southern ; and New York Central & Hudson River roads, which will keep them busy for some time to come. A number of passenger engines for the last-named road are nearly finished, and are intended for fast running, the cylinders being 18 × 24 in., and the driving wheels 6 ft. 3 in. in diameter. The boilers are fitted with the Railway Combustion Co's. apparatus, comprising the circulating water-bridge, smoke-arch extension, and adjustable diaphragm, that are already in use on the road, and which have given the most satisfactory results. During the present year the works have turned out an average of eleven engines per month, but in pressing emergencies a larger number can be built within the same time.

The shops are supplied with the best machinery and appliances for locomotive construction, but the increase of business has rendered it necessary to provide additional facilities, including a new hammer shop, 60 × 170 ft., which is now nearly completed, and also an extension of 50 × 125 ft. to their foundry, which is well under way, and will be ready for use in January. The hammer shop will contain three large steam hammers which will, in connection with other improvements that are in progress, add very materially to the present capacity of the works.

* * *

The Indiana Car Works, at Cambridge City, has increased its working force to 350 men, and is working 12 hours per day instead of nine, as heretofore. The rapid increase of business has made this necessary, and the management is of the opinion that it will be several months before the company can see its way clear of the heavy orders now in.

A new "Indicator" has been placed on several of the cabooses running between Philadelphia and Columbia on the Pennsylvania Railroad. It is expected to register the number of miles traveled per hour by the car, the rate of speed, the number and duration of the stops, etc.; in fact, give a complete and accurate account of the doings of the train to which the car is attached.

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EDITORIAL ANNOUNCEMENTS.

Subscription.—One Dollar *a year in advance, postage prepaid. One copy will be sent free for one year to any person sending us five new subscribers.*

Addresses.—*Business letters should be addressed, and drafts and money orders made payable, to* The National Car-Builder. *Communications for the attention of the Editor should be addressed* Editor National Car-Builder.

Advertisements.—*Nothing will be inserted in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *The editorial department will contain our own views and opinions ; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.*

Contributions.—*Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.*

Special Notice.—*As the* Car-Builder *is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of the month.*

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A. Williams & Co., 283 *Washington Street, Boston, Mass.*

L. Schaffner, *Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.*

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RAILROAD ACCIDENTS.

When the magnitude of railroad operations in this country is considered, the number of accidents which occur involving loss of life is very small compared with the number of persons carried upon trains of every class. Whatever may be the culpability of managers or their subordinates in any particular case, the event is accepted as an unavoidable incident of a system which must always be attended with hazard and danger. The horrors of any particular casualty cause but a transient shock, and even, when brought to our very homes and households, they do not deter us from taking the chances as before, knowing as we do that they are very small, as much so as being struck with lightning or bitten by a rabid dog. This, however, does not mitigate in the smallest degree the sufferings of the victims, nor does it excuse the negligence or lessen the responsibility of the parties through whose instrumentality such things occur. There are very few accidents which occur on our railroads, whether from misplaced switches, unguarded crossings, defective signals, running out of time or other causes, that could not have been prevented by the strict observance of rules and discipline such as should be found upon every well-managed road. The familiar statement that railway companies are as much interested in the prevention of accidents as the public can be, on account of damages to persons and rolling stock, must be taken with some allowance.

The frequency of accidents upon English roads led to the appointment some three years ago of a royal commission to investigate the causes and suggest a remedy. One branch of the inquiry was in reference to the killing of employés, the number killed during four years being estimated at 3,000. The causes were said to be due in large measure to overwork and an insufficient force, involving increased risk and a corresponding increase of peril to trains and passengers. An array of proof was also presented to the effect that the gain from niggardly and inefficient management and poor equipment far exceeded the losses from an occasional accident, and it was even alleged that managers were tempted to work the traffic badly, and accept as a matter of calculation the risk of disaster. Few of our own roads, it is to be hoped, are justly liable to such an arraignment. There are many accidents which are the results of causes that cannot be foreseen nor provided against, such as malicious obstructions, hidden defects in materials and the like. These, however, are comparatively infrequent, but there are a great many others that are primarily due to negligence, lax-discipline, defective rules, and stupid dull-minded subordinates. Rules may be ever so good, and cover every contingency that is likely to happen, but if they are not rigidly enforced they are of little avail, and whatever immunity from accident there may be is sheer good luck. On many roads freight trains are run at a speed of 20 or even 30 miles an hour on down grades, to make up for time lost on up grades when the trains are too heavy for the engines. This is a very common thing, although the use of speed-recorders enables superintendents to know the exact speed of trains at any and every point. The running of trains in a fog, even where the block system is in use, is always attended with danger from grade crossings or obstructions that cannot be seen. A large proportion of the current run of accidents are due to misplaced switches, and it is difficult to see how the number can be much lessened so long as the position of switches is made dependent upon the watchfulness of individual persons whose pay is small, and whose sense of responsibility is perhaps not very great. However vigilant and alert such a person may be, he is liable to be overtaken at some time by a momentary forgetfulness or confusion of ideas. He is not an inanimate automatic machine moved by blind mechanical forces like an automatic signal. There is always a chance that the switch will be set wrong, although it might not occur once during years of service. The only safety lies in making the position of switches independent as far as possible of personal supervision, by connecting them with signals that will infallibly indicate their position to approaching trains.

The term "accident," as it is often applied, is a misnomer, because it conveys the impression that nobody is to blame. To say that the immolation of a score of victims on a railroad track is due to switches and signals wrongly set or out of order, is equivalent to saying that they perished for want of breath—so far as getting at the true cause is concerned. It is easy to allege secondary causes, but the primary causes are what the public are concerned to know. They want to know what in the chain of cause and effect preceded the wrong setting of the switches and signals, and whether the catastrophe was preventable by precautions which might have been, but which were not, taken. The principal is legally and morally bound by the acts of his agent, and railroad managers are likely to be held amenable to the same code when it is made to appear that such agent is unfit to perform the duties assigned to him.

What we have said has been often said before, and may seem trite and commonplace, but in view of the recent fearful record of accidents it will bear repetition. A car in an express train on the Fitchburg road leaves the track while rounding a curve at the rate of thirty miles an hour. An accommodation train loaded with passengers, starts from Pittsburg in three sections, the engine of the second section running into the rear car of the first, crushing and scalding to death a large number of persons, and all because a flagman of long experience was momentarily forgetful of his duty. We need not refer to others of a less aggravated nature which occurred in various parts of the country during the past month. They will soon be lost sight of in the march of events, and the moral certainty that more of the same sort are to follow.

CAR WARMING AND VENTILATION.

If there is anything which the traveling community especially insists upon, it is that railway passenger cars shall be comfortably warmed. As soon as the temperature falls to a point which causes the least discomfort the appliances for heating must be brought into requisition, even if the heat furnished is so great as to necessitate the opening of windows and doors in order to modify it. With most people an excess of warmth is more endurable than an insufficient supply. If there is too much of it, it is easily got rid of, but if there is not enough, there is no remedy but to worry conductors and brakemen until the car is made comfortable. The methods employed for doing this are various, and usually consist of wood or coal burning stoves. The result, as most people are aware, is not at all times the ideal of perfect comfort, but a series of transitions from one extreme of temperature to another, depending upon the state of the weather, the means of ventilation, and the varying sensibilities of the passengers. We need not speak of the many attempts that have been made to warm cars by other and more complicated apparatus for the circulation through the train of hot water or steam from the engine or from a special boiler in the baggage car. These attempts have, in most cases, proved quite successful, but, for obvious reasons, they are not likely to supersede, to any great extent, the use of stoves by which each car can be warmed separately from the others.

The warming of cars, however, is inseparably connected with the important matter of ventilation. Inventors have exercised their ingenuity in devising plans to meet all the requisites of this double problem, but it is safe to say that no specific method has been discovered that has met the approval of any considerable number of railway managers in the country. The dimensions and uses of an ordinary passenger car are such as to make it extremely difficult in winter to provide and maintain within it a uniform medium temperature, combined with suitable ventilation, so that neither the one nor the other shall be thought of by the comfortable and satisfied passengers. The great difficulty to be overcome is the unequal temperature between floor and roof, and especially is this the case in severe winter weather. There is nothing more annoying or detrimental to health than cold feet, and it should be the aim of every appliance for the warming of cars to reverse as far as possible the relative positions which bodies of cold and rarified air naturally assume within a car, or if they cannot be reversed, they should, as far as possible, be mixed together and the entire volume be kept uniform. There are ways by which this can be done, but they are as a general thing too expensive and complicated, and too much of an innovation upon ordinary methods to be applied to cars generally, or, at least for the present. The nice point is to admit the fresh outside air in cold weather in such a way that nobody will know it, either on account of its temperature or the force of the current, and also in quantity similar to that which is admitted through doors and windows in summer. There is, in our judgment, but one way of doing this, or rather but one governing principle to which specific methods should be made to conform. The air admitted from without should be warmed before coming in contact with the passengers, and this can be done very effectively in various ways. The vitaited air, which it must necessarily displace and expel, should be exhausted through openings next the car floor, and not at the top. In this way none of the incoming warm air is wasted, while the cold air next the floor is constantly forced out and replaced by that which is warmer and purer, thus insuring a greater uniformity of temperature as well as a continuous supply of fresh warmed air. In the discussions that have taken place upon this subject, a great deal of importance has been attached to the specific character of the various atmospheric impurities generated in a crowded car, as if there was any question as to their presence or deleterious qualities. They are in the car, and the more so in proportion to the number of its occupants, and the essential thing is to get them out in a quiet automatic kind of way, so that no one will be aware of it. If ventilation is necessary in the rooms of dwelling houses, public halls, school rooms, and the like, it is much more so in crowded railway cars where the allotted space is much smaller for each person. An ordinary day car contains about 2,550 cubic feet of space, aside from what is occupied by passengers, seats, stoves, saloon, etc. This, divided among 60 passengers, would give about 43 cubic feet to each, which is about what is contained in a box 3½ feet square. It will readily be admitted that this is rather narrow quarters for a person to be confined in for any length of time. With due allowances for cracks and crevices, he would have to breath the same air over two or three times. This would be bad enough, but not quite so bad as breathing the air expelled from other people's lungs, as he would be compelled to do if seated in a car with 59 other passengers. This very fairly illustrates the actual condition of a vast number of people who travel in crowded cars in winter, however little some of them may be aware of it.

It is no very difficult matter to ventilate cars in summer. When windows and doors are open the cars will ventilate themselves. Dust, smoke and cinders will come in, of course, more or less, but these, although annoying, are not deadly, like the poisonous products of respiration and the filthy odors arising from a lack of personal cleanliness. It is these that accumulate in the car in winter unless adequate provision is made to prevent it. The opening of doors, windows and roof-ventilators is a very effective way, but it lets in the cold and produces a degree of discomfort far more annoying to most people than the breathing of noxious gases.

HOT JOURNAL-BOXES.

There is much less complaint about hot journals than there was a few years ago, and the reason doubtless is that not so many journals get hot. Whether the causes have been so clearly ascertained as to admit of an effective remedy in every case, is more than doubtful, but some progress has certainly been made in the right direction. The subject is a very complicated one, and the more it is studied, the more evident will it be that the heating of journals is not altogether due to imperfect lubrication, but to many other conditions in which material, fitting, weight of load, surface under pressure, velocity, etc., have much to do. The two factors of weight and velocity are not constant, but variable quantities. Car journals have at times only the weight of the car to sustain, and at other times the weight of a full load. The bearing surfaces vary with the size of journals and brasses, so that a lubricant that would be retained between the frictional surfaces with a light load, would be pressed out under a heavy load. Lubricants must be adapted to the functions which the machinery to which they are applied has to perform, and to insure the best results, the surfaces in contact must be kept coated at all times, under every degree of pressure and with all velocities. The endless experiments that have been made to ascertain the comparative lubricating qualities of the numerous oils, the advantage of mixtures, the presence of acids, the tendency to evaporate, gum, corrode, freeze, and so on, with no very marked results, except to show that for railway rolling stock the purer, heavier and more expensive oils are the best and the most economical.

Hot boxes, however, can never be entirely prevented by mere lubrication. Journals often get hot apparently under the same conditions with which they have at other times run perfectly cool, and, as is well known, the experience of one road in the use of a particular lubricant differs greatly from that of another road. The cause is frequently not at all in the lubricant, but in excessive weight carried, or to ill-fitting brasses and journals. A brass casting, with its bearing surface as perfect as ordinary mechanical means can make it, is not necessarily a good fit to the journal. Indeed, it may be said that what is called careful workmanship in the adjustment of car journals and brasses can never produce as perfect a fit as is obtained by actual running contact, which is a process of self-fitting. Nor does this cure the difficulty in every case, even with good lubrication. There may be a lack of homogeneity in the fibrous structure of the two metals, and especially of the iron or steel of which the journal is composed, and which is not apparent on the surface or to ordinary inspection. Much importance has been attached to the matter of ascertaining the total number of hot boxes upon different roads, and the cost of the delays from this cause on all the roads. This is well enough, perhaps, as showing the extent of the mischief, but it does not reach and remove the causes. One road may have but little trouble from hot boxes, but is does not follow that it is due to a certain kind of oil or patent mixture. Another road may use the same things with quite different results, the difference being due to other causes. We are inclined to think that good fitting is the most important thing to be looked after, and the next, a lubricant that will keep its place between the journal and bearing under the varying pressures of light or loaded cars.

It has been said by an oil manufacturer that what is the best oil for railway purposes will never be determined, because individual opinion will not allow it. There is, doubtless, a good deal of truth in this, and it may also be said that it will never be determined by the many curious things disclosed by the refining and analyzing processes of the laboratory under the direction of scientific experts. What railroad men want to know is, the particular ingredient that will keep an ordinary freight car journal from getting hot while in ordinary service, and at the same time be the most economical in the matter of consumption; and this they are gradually finding out by the running of the journals themselves while making their regular mileage with average speed and loads.

◆

Death of Mr. Enos Varney.

The sudden death of Mr. Varney, the Master Car-Builder of the Fitchburg road, will cause a shock of surprise and grief to many of our readers, and especially to his associates of the Master Car-Builders' Association, of which he was a valued and useful member. He was a victim of the accident which occurred on that road on the evening of October 7. The second car from the rear end of an express train left the track while passing through the town of Littleton, taking with it the rear car, in the forward end of which Mr. Varney was sitting, the end striking a freight car on a siding with such force as to cause his instant death by the concussion. Mr. Varney was 68 years of age, and leaves a wife and three daughters, one of whom is married. In his boyhood he learned the carpenter's trade, and soon afterward became identified with car building in its early development. He was connected with the Fitchburg road a great many years, and this, together with the fact that no accidents have occurred on the road, previous to this one, for more than thirty years, in which a passenger has been killed, is an evidence that in his vocation Mr. Varney was an efficient and capable mechanic. His personal intercourse was characterized by a kindliness and urbanity that will cause his memory to be cherished by all who knew him.

◆

Continuous Draw-Bar Patents.

The following circular has been issued by the Secretary of the Western Railroad Association:

CHICAGO, Sept. 9, 1880.

To the Members of the Association:

GENTLEMEN: Claims have been pending for several years that the Continuous Draw-Bar sold by the Continuous Draw-Bar Company under the Middleton and the Griffith and Patterson patents is an infringement of patent 71,580, granted 3d December, 1867 (reissue No. 8,095, granted 19th February, 1878), to Edward L. Caum.

This Association has continuously advised against entertaining this claim, but to quiet all questions, and at our instigation, the Continuous Draw-Bar Company has recently purchased the Caum patent, its owners inserting in the assignment a full and absolute release to all the members of the Eastern and Western Railroad Associations from any and all liability for or on account of any infringement heretofore of said patent.

Yours truly,

J. H. RAYMOND, Secretary, etc.

◆

Got a Corner.

On one of the morning trains over the Erie road, the other day, a farmer-looking man walked the length of a car without finding an empty seat, and he slowly returned to one occupied by a lone man, who at once spread himself out as much as possible, and suddenly became deeply interested in his newspaper. The farmer halted beside the seat, but the other made no movement. Even after a full minute had elapsed there was no sign that he meant to share his quarters with the other. Then the farmer touched his arm and said:

"If you can hang on long enough you'll make a fortune."

"What—what's that, sir?" demanded the other, as he looked up.

"It's a big thing—hang on to it!" whispered the farmer.

"What is it? What do you mean, sir?"

"I tumble; but I won't give it away!" chuckled the farmer.

"What do you mean, sir?"

"I mean that you've got the biggest corner on the hog market ever known in this country, and if you don't make a million dollars out of it I'll eat codfish for a year."

Half of that seat was suddenly vacated, but the farmer preferred to stand up and brace against the stove.

◆

THE *Elevated Railway Journal* has been changed from a folio to a sixteen page publication, which is a decided improvement in form. In other respects it is full of good things that make it attractive to the general reader as well as to railroad men.

THAT excellent publication, *The Coach Painter*, Newark, N. J., improves both in matter and appearance with every number. It has commenced the publication of the full discussions of the Car Painters' Association at its late meeting in St. Louis.

THE HARTSHORN SHADE ROLLER is getting to be more extensively used upon railway cars every year. The more its merits are understood the more thoroughly is it appreciated. We are informed by the manufacturers that their sales for the present year are greatly in excess of any previous year, and that the rollers are being used by leading car companies, including the Wagner, Gilbert & Bush. Wason, and the Barney & Smith Co.; and also by a large number of railroads in this country and in Europe. The roller has also received awards at the Philadelphia Centennial in 1876, at Paris in 1878, and at Melbourne, Australia, in 1880. Full particulars with models can be had at the New York office, 486 Broadway.

THE car shops of the Mowry Car and Wheel Works, of Cincinnati, have been sold to the Cincinnati Street Railway Co., and the machinery has been sold at auction. The Mowry Co. will continue the manufacture of car wheels as heretofore. Their foundry has been enlarged, so as to double its capacity for wheels and castings.

IN our notice of the new Wagner sleeping coaches in our last issue, built by the Gilbert & Bush Co. for the New York Central road, we omitted to say that the deflectors and exhaust ventilators were supplied by the Globe Ventilator Co., of Troy, N. Y. We are informed that the Wagner Co. have ordered all their cars fitted with the deflectors of the Globe Company.

THE DETROIT CAR SPRING CO. have erected a new brick shop, 50 × 225 feet, to enable them to meet the increased demand for elliptic car springs. These shops will be ready by the first of November, and will be fitted up with furnaces designed especially for them, and also with the latest and most approved machinery. This addition is an extension to their present works for the manufacture of spiral and nest springs, which are running on large orders, and is the third enlargement made within thirteen months. With excellent facilities for receiving and shipping, and with a sufficiency of skilled labor, the company will be able to meet the demands of the market for elliptic flat and round bar springs with the utmost promptitude and dispatch.

THE CHICAGO CAR AXLE COMPANY was organized in June last for the manufacture of locomotive and car axles, engine and mill shafting, shape work, etc. The present buildings of the company are 80 × 200 feet, but are being extended by the addition of two more furnaces and one more hammer. A force of 50 men is now employed on full time, and 60 axles and 1,000 pounds of shafting are turned out daily.

Our Directory.

We note the following changes since our last issue. Readers are requested to give us prompt notice of changes when they occur:

Canada Central.—Mr. T. A. McKinnon having resigned his position as Superintendent, all communications heretofore sent to him should be addressed to Archer Baker, General Manager, at Brockville, Ontario.

Chicago, Burlington & Quincy.—Mr. Thomas J. Potter has been appointed general manager of the Chicago, Burlington & Quincy Railroad and leased lines, embracing all roads operated by the company east of the Missouri river, with his headquarters at Chicago.

Denver & Rio Grande.—Major A. B. Garner has been appointed Purchasing Agent.

Dorchester & Delaware.—Mr Thomas E Wright has been appointed Superintendent, in place of James M. Murphy.

Galveston, Houston & Henderson.—Mr. John G. Conlon is appointed Master Mechanic, in place of Mr. W. F. Converse, who retires.

Indiana, Bloomington & Western.—General manager B. S. Henning announces that Mr. I. D. Barton having resigned the position of Superintendent, the office is abolished. Mr. C. E. Henderson is appointed Assistant General Manager.

Petersburg.—Mr. R. B. Andrews, for many years the Master Mechanic of this road, died Sept. 22.

St. Paul, Minneapolis & Manitoba.—Mr. W. D. Hawkins has been appointed Division Master Mechanic, with office at Fergus Falls, Minn. He was for a long time engineer on the Chicago, Burlington & Quincy.

Selma, Rome & Dalton.—Major John F. O'Brien will, for the present, act as General Manager, in addition to his duties as General Superintendent of the East Tennessee, Virginia & Georgia road.

Wabash, St. Louis & Pacific.—This company has taken possession, under lease, of the Missouri Iowa & Nebraska; and Toledo, Peoria & Western roads. They will hereafter be known as the Peoria & Iowa Division. Mr. W. F. Merrill is the Division Superintendent.

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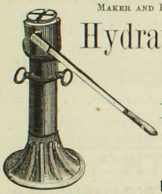

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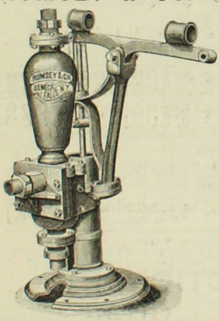

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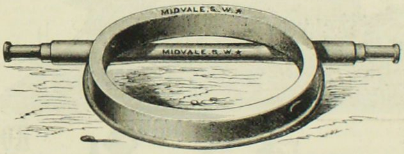
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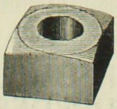

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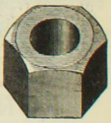

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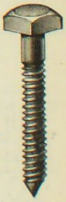

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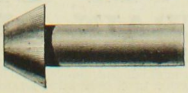

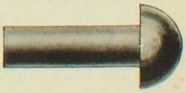

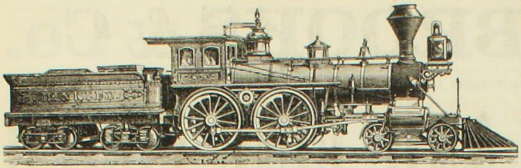

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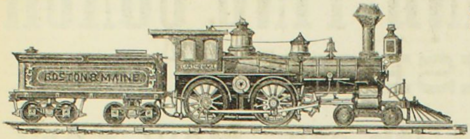

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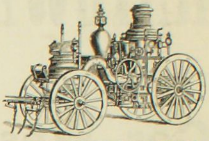

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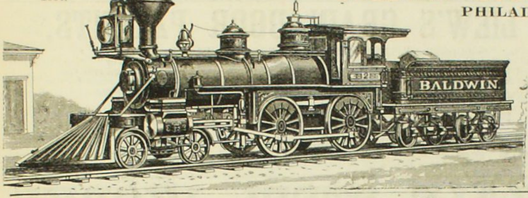

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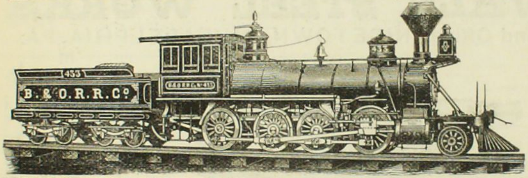

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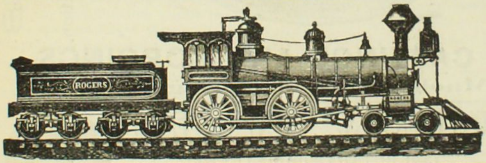

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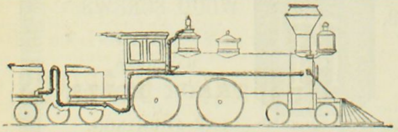

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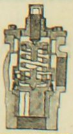

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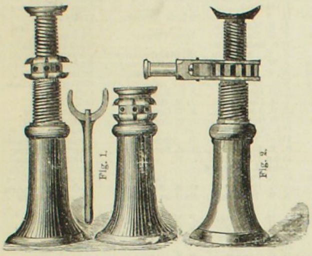

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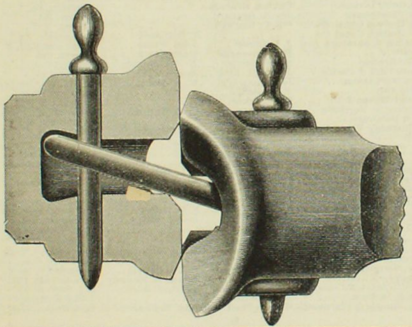

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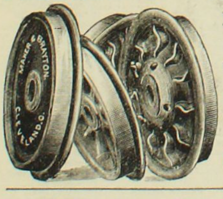

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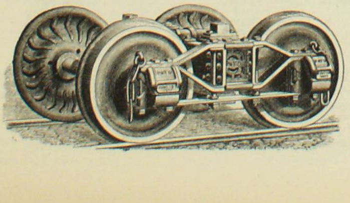

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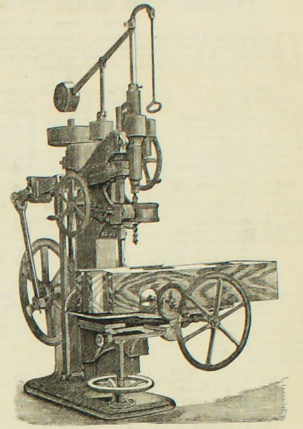

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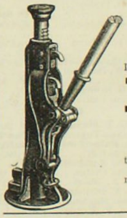

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REFERENCES.—* Mechanical Engineer. † Mechanical Superintendent. ‡ General Master Mechanic. †† Gen. Master Car-Builder. § Master of Machinery. | General Foreman. ** Supt. of Machinery. §§ Supt. of Motive Power and Machinery. ‡‡ Supt. Cars and Buildings. ¶ Supt. of Equipment. ¶¶ Ass't Supt. of Equipment.

A

Railroad.	*Master-Mechanic.*	*Master Car-Builder.*	*Residence.*
Adirondack	Jacob Myers	James J. Traver	Saratoga, N. Y.
Alabama Central	Simon Gay	James Owens	Selma, Ala.
Alabama Great Southern	§§John McVey		Chattanooga, Tenn.
Albany & Susquehanna	§§R. C. Blackall	R. C. Blackall	Albany, N. Y.
Albany & Susquehanna	C. A. Jones	J. R. Skinner	Oneonta, N. Y.
Arkansas Midland	J. B. Johnson	J. B. Johnson	Helena, Ark.
Ashtabula & Pittsburg	Geo. J. Parkins	Wm. Marquis	Allegheny City, Pa.
Atchison, Topeka & Santa Fe	§§Geo. Hackney	Geo. Hackney	Topeka, Kan.
Western Division	A. C. Stiles		Pueblo, Col.
Atchison & Nebraska	T. D. Volk	T. A. H Berkey	Atchison, Kan.
Allegheny Valley	G. W. Glass	R. Gunning	Pittsburgh, Pa.
Atlanta & Charlotte Air-Line	C. D. Wall	C. D. Wall	Atlanta, Ga.
Atlanta & West-Point	Wm. Rushton		Atlanta, Ga.
Atlanta & West-Point		R. D. Cole	Newnan, Ga.
Atlantic & North Carolina	Basil Manly		New Berne, N. C.
Atlantic, Mississippi & Ohio			
Norfolk & Peter. Division	J. T. Robinett	J. T. Robinett	Petersburg, Va.
Virginia & Tenn. Division	F. Sterk	W. A. Morgan	Lynchburg, Va
Western Division	A. C. Stiles		Pueblo, Col.

B

Railroad.	*Master-Mechanic.*	*Master Car-Builder.*	*Residence.*
Baltimore & Ohio	§John C. Davis	J. S. Shryack	Baltimore, Md.
Baltimore & Ohio	A. J. Cromwell	|James H. Mill	Baltimore, Md.
Baltimore & Ohio	Wm. Edwards		Martinsburg, Va.
Baltimore & Ohio	I. N. Kalbaugh		Piedmont, Va.
Baltimore & Ohio	E. L. Weisgerber		Grafton, W. Va.
Baltimore & Ohio	Robert Maxwell		Cumberland, Md.
Baltimore & Ohio	Chas. Hirsch		Wheeling, W. Va.
Baltimore & Ohio	S. B. Crawford		Parkersb'rg, W. Va.
Central Ohio Division	O. B. Perkins		Zanesville, O.
Ohio & Chicago Division	§Sam. Houston		Newark, O.
Central Ohio Division	James Stewart		Newark, O.
Central Ohio Division	H. M. Ingler		Bellaire, O.
Lake Erie Division	And. Beckert		Sandusky, O.
Chicago Division	W. Y. Johnston		Garrett, Ind.
Chicago Division	F. J. Gunther		Chicago Junc., O.
Chicago Division	Geo. Wilson		Kingston, Ill.
Pittsburg Division	John E. Sampsel		Connellsville, Pa.
Baltimore & Potomac	§§R. H. Soule		Baltimore, Md.
Bath & Hammondsport	Allen Wood		Ham'ondsp't, N. Y.
Bedford, Springville, O. & Bloom'd	Capt. Geo. Elliott		Bedford, Ind.
Bellefonte & Snow-Shoe	H. D. Landis	H. D. Landis	Bellefonte, Pa.
Bennington & Rutland	G. W. Blanchard		Rutland, Vt.
Boston & Albany	§§A. B. Underhill		Springfield, Mass.
Boston & Albany		F. D. Adams	Allston, Mass.
Boston & Albany	T. B. Purvis		Greenbush, N. Y.
Boston & Albany		J. E. Doran	E. Albany, N. Y.
Boston & Providence	George Richards	John Lightner	Roxbury, Mass.
Boston, Barre & Gardner	Chas. F. Brigham		Worcester, Mass.
Boston, Concord & Montreal	Ralph Adams	L. D. Pickering	Lake Village, N. H.
Boston & Maine	Wm. Smith		Boston, Mass.
Boston & Maine		D. C. Richardson	Lawrence, Mass.
Boston & Lowell	J. F. Crockett	J. F. Crockett	Boston, Mass.
Boston & New York Air-Line			New Haven, Conn.
Boston, Revere Beach & Lynn	J. L. Folsom	John Coghlan	Boston, Mass.
Brunswick & Albany			Brunswick, Ga.
Burlington & Missouri River in Neb.	D. Hawksworth	D. Hawksworth	Plattsmouth, Neb.
Burlington, Cedar Rapids & Nor.	R. W. Bushnell		Cedar Rapids, Ia.
Burlington & Southwestern		A. B. Allen	Farmington, Ia.
Buffalo & Southwestern	J. G. Hubbard		Buffalo, N. Y.
Buffalo, New York & Philadelphia	Allen Vail		Buffalo, N. Y.

C

Railroad.	*Master-Mechanic.*	*Master Car-Builder.*	*Residence.*
Cairo & St. Louis	**G. B. Simonds	G. B. Simonds	E. Carondelet, Ill.
Cairo & Vincennes	A. Van Tuyl	A. Van Tuyl	Carmi, Ill.
California, Pacific & Northern	D. Rutherford	D. Rutherford	So. Vallejo, Cal.
Camden & Atlantic	Rufus Hill	S. Wills	Camden, N. J.
Canada Central	H. J. Marshall		Brockville, Can.
Canada Southern and Branches	*John Ortton	††John Ortton	St. Thomas, Ont.
Canada Division	W. A. Short	Robert Potts	St. Thomas, Ont.
U. S. Division	O. P. Dunbar		Grosse Isle, Mich.
Carolina Central	§Jas. Maglenn	S. R. Ethridge	Laurinburg, N. C.
Catasauqua & Foglesville	Tho. E. Evans	Chas. J. Holbach	Catasauqua, Pa.
Central of Georgia	D. D. Arden		Savannah, Ga.
Atlanta Division	D. M. Gugel	Jas. A. Knight	Macon, Ga.
Central of New Jersey	Wm. Woodcock	George Hackett	Elizabeth, N. J.
Lehigh & Susquehanna Div.	L. C. Brastow	L. C. Brastow	Wilkesbarre, Pa.
Central of Iowa	M. C. Wheeler	T. L. Seevers	Marshalltown, Ia.
Central Pacific	‡A. J. Stevens	††Benj. Welch	Sacramento, Cal.
Western Division	Geo. D. Welch	|W. B. Ludlow	Oakland, Cal.
Central Pacific		|G. J. Turner	Sacramento, Cal.
Visalia Division	S. Johnson		Tulare, Cal.
Sacramento & Oregon Div.	M. W. Cooley	Phil. Douglass	Sacramento, Cal.
Truckee Division	Geo. Gregg	|Wm. McPherson	Wadsworth, Nev.
Humboldt Division	W. F. Smith	|J. C. Doughty	Carlin, Nev.
Salt Lake Division	Jas. Lamb		Terrace, Utah.
Salt Lake Division		||A. Sherburne	Ogden, Utah.
Central Vermont	§§J. M. Foss		St. Albans, Vt.
New London & Northern Div.	I. W. Dow	S. O. Banks	New London, Conn.
Rutland Division	N. L. Davis	N. L. Davis	Rutland, Vt.
Chesapeake & Ohio	§John McFarland	J. N. King	Richmond, Va.
Chesapeake & Ohio	Tho. L. Chapman	H. C. Bassinger	Huntingdon, W. Va.
Cheraw & Darlington	John Bissett	W. H. Day	Florence, S. C.
Cherokee	C. E. Scruton		Cedartown, Ga.
Cheshire	F. A. Perry	|A. E. Howard	Keene, N. H.
Charlotte, Columbia & Augusta		J. C. Troeger	Columbia, S. C.
Charleston & Savannah	H. A. Ulmo	J. D. Murphy	Charleston, S. C.
Chicago & Pacific	James Penny	C. N. Code	Chicago, Ill.
Chicago & Northwestern	** Geo. W. Tilton	††William Campbell	Chicago, Ill.
Wis., Mad. & Mill. Divis.			Chicago, Ill.
Galena Division			Chicago, Ill.
Iowa Division	J. O. Chapman	H. L. Preston	Clinton, Ia.
Peninsula Division	Geo. White		Escanaba, Mich.
Winona & St. Peters Div.	W. A. Scott	W. A. Scott	Winona, Minn.
Chicago & Alton	§§Wm. Wilson		Bloomington, Ill.
Kansas City & St. Louis Div.	J. C. Morse		Mexico, Mo.
Chicago, Burlington & Quincy	§§H. B. Stone	*J. Chistiansen	Aurora, Ill.
Galesburg Division	Robert Colville		Galesburg, Ill.
Iowa Division	Joel West		Burlington, Ia.
Iowa Division	C. W. Eckerson		Creston, Ia.
St. Louis Division	H. Whiting		Beardstown, Ill.
Chicago & Springfield	W. B. McKenna		Clinton, Ill.
Chicago, Clinton, Dubuque & Minn.	E. Smedley	E. Smedley	Dubuque, Ia.
Chicago, Rock Island & Pacific	‡T. B. Twombly	B. K. Verbryck	Chicago, Ill.
Keokuk & Des Moines Div.	S. W. Wakefield	Henry Kummer	Keokuk, Iowa.
Southwestern Division	R. O. Carscadin		Trenton, Mo.
Chicago & West Michigan	Russell Booth		Muskegon, Mich.
Chicago & Eastern Illinois	Allen Cooke	Allen Cooke	Danville, Ill.
Chicago & Iowa	H. S. Bryan		Aurora, Ill.
Chicago & Grand Trunk	†K. Blackwell	Geo. W. Prescott	Battle Creek, Mich.
Chicago, Milwaukee & St. Paul	J. M. Lowry		Milwaukee, Wis.
La Crosse & P. Du. Ch. Div.		John Baillie	Milwaukee, Wis.
Northern Division		Wm. E. Kittredge	Milwaukee, Wis.
Iowa & Minn. Division	J. O. Pattie		Minneapolis, Minn.
Racine & S. West Div.	John Taylor	E. A. Eddy	Racine, Wis.
Sioux City & Dak. Div.	J. H. Moulton		Yankton, Dak.
Southern Minnesota Div.	J. B. Henney	J. B. Henney	Hokah, Minn.
Chicago & Paducah	T. J. Grosh	T. J. Grosh	Streator, Ill.
Chicago, Pekin & Southwestern	A. R. Overton		Joliet, Ill.
Chicago, Pekin & Southwestern		F. Shields	Streator, Ill.
Chicago, St. Louis & New Orleans	**W. H. Purdy		McComb C'y, Miss.
Chicago, St. Louis & New Orleans	E. D. Anderson		McComb C'y, Miss.
Chicago, St. Louis & New Orleans	J. M. Keith		Jackson, Tenn.
Chicago, St. Louis & New Orleans	J. F. White		Water Valley, Miss.
Chicago, St. Paul & Minneapolis	Matt Ellis	J. C. Fischer	Hudson, Wis.
Cincinnati, Wabash & Michigan	S. B. Tinker	S. B. Tinker	Wabash, Ind.
Cincinnati, Hamilton & Dayton	James Eckford	W. H. H. Allison	Cincinnati, O.
Indianapolis Division	Edward Moore		Indianapolis, Ind.
Cin., Ind., St. Louis & Chicago	§J. S. Patterson	J. S. Patterson	Cincinnati, O.
Cincinnati, Richmond & Chicago	Wesley S. Brewer		Richmond, Ind.
Cin. Rockport & So. Western	B. W. Smith	J. H. Bauman	Rockport, Ind.
Cincinnati, Sandusky & Cleveland	Jos. L. Porter		Sandusky, O.
Cincinnati Southern	J. Ivanson		Ludlow, Ky.
Cleve., Col., Cin. & Indianapolis	‡L. S. Young	††L. S. Young	Cleveland, O.
Indianapolis Division	A. R. McAlpine		Brightwood, Ind.
Columbus & Cin. Division	F. G. Kaufholz	Wm. Cleave	Cleveland, O.
Cleveland & Marietta	Tho. Robertson		Marietta, Ohio.
Cleveland & Pittsburg	N. E. Chapman	|A. Steinbrunner	Cleveland, O.
Cleve., Mt. Vernon & Columbus	J. W. Holloway	J. W. Holloway	Akron, O.
Cleve., Tusc. Valley & Wheeling	W. F. Turreff	|Geo. H. Pratt	Black River, O.
Cobourg, Peterboro & Marmora	Wm. Polson		Cobourg, Canada.
Columbus & Hocking Valley	I. G. Hutchins	J. M. Rockafield	Columbus, O.
Columbus & Toledo	I. G. Hutchins	J. M. Rockafield	Columbus, O.
Concord	J. T. Gordon	J. T. Gordon	Concord, N. H.
Concord & Portsmouth	J. T. Gordon	J. T. Gordon	Concord, N. H.
Concord & Claremont	**J. N. Lauder		Concord, N. H.
Connecticut River	§Wm. H. Stearns	R. Hitchcock	Springfield, Mass.
Connecticut Valley	S. E. Brewer	S. E. Brewer	Hartford, Conn.
Connecticut Western	John C. Barton		Hartford, Conn.
Conn. & Passumpsic Rivers	John R. Hubbard		Lyndonville, Vt.
Corning, Cowanesque & Antrim	O. C. Patchell	O. C. Patchell	Corning, N. Y.
Cumberland Valley	A. S. Hull	G. W. Nitterhouse	Chambersburg, Pa.
Cumberland & Pennsylvania	N. W. Howson	Nathan Binnix	Mt. Savage, Md.

D

Railroad.	*Master-Mechanic.*	*Master Car-Builder.*	*Residence.*
Dak. So. & Sioux City & Pembina	J. H. Moulton	J. H. Moulton	Yankton, Dak.
Danbury & Norwalk	N. M. George	N. M. George	Danbury, Conn.
Danville & Southwestern	B. L. Baldwin		Danville, Ill.
Davenport & Northwestern	H. E. Woods		Davenport, Ia.
Dayton & Union	H. S. Gordon	H. S. Gordon	Dayton, O.
Dayton & Southeastern	Wm. E. Cooper		Dayton, O.
Dayton & Michigan	John Black		Lima, O.
Delaware, Lackawanna & West	Walter Dawson	Robert McKenna	Scranton, Pa.
Morris & Essex Division	W. H. Lewis		Kingsland, N. J.
Morris & Essex Division		J. W. Baker	Dover, N. J.
Oswego & Syracuse Division	James Buchanan		Syracuse, N. Y.
Utica, Chenango & Susq. Div.	Tho. Thatcher		Utica, N. Y.
Bloomsburg Division	Charles Graham		Kingston, Pa.
Delaware & Chesapeake	Jos. A. Baynard		Easton, Md.
Delaware & Hudson Canal Co	**R. C. Blackall		Albany, N. Y.
Delaware & Hudson Canal Co		T. Orchard	Carbondale, Pa.
Rensselaer & Saratoga Div.	J. L. Corey	John Wicks	Green Island, N. Y.
Denver Pacific	§R. McDougall	|John Clock	Denver, Col.
Denver & Rio Grande	N. W. Sample	N. W. Sample	Denver, Col.
Denver, South Park & Pacific	James H. Kirk	James H. Kirk	Denver, Col.
Des Moines & Fort Dodge	John McGrayel	E. A. Avery	Grand Junction, Ia.
Detroit & Bay City	R. P. Baillie		Bay City, Mich.
Detroit, Grand Haven & Mil.	Fred Parker		Detroit, Mich.
Detroit, Lansing & Northern	G. C. Watrous	G. C. Watrous	Ionia, Mich.
Dorchester & Delaware			Cambridge, Md.
Dunkirk, Allegheny Val. & Pitts.	J. C. Haggett	J. C. Haggett	Dunkirk, N. Y.

E

Railroad.	*Master-Mechanic.*	*Master Car-Builder.*	*Residence.*
East Broad Top	Wm. C. Maynes		Orbisonia, Pa.
Eastern	J. D. Billings		East Boston, Mass.
Eastern Kentucky	D. L. Weaver	D. L. Weaver	Riverton, Ky.
E. Tennessee, Virginia & Georgia	C. A. Hodge	Joseph Armbruster	Knoxville, Tenn.
Erie & Pittsburg	J. N. Wood	J. N. Wood	Erie, Pa.
Eureka & Palisade	J. M. Alson		Eureka, Nev.
European & North Am. (of Maine)	A. O. Bailey	A. O. Bailey	Mattawamke'g, Me.
Evansville & Terre Haute	John L. White	Joseph Stiker	Evansville, Ind.
Evansville, Terre Haute & Chic.	§§W. D. Macfarlane		Terre Haute, Ind.

F

Railroad.	*Master-Mechanic.*	*Master Car-Builder.*	*Residence.*
Fitchburg	§§Geo. A. Cooledge	Enos Varney	Charlestown, Mass.
Vermont & Mass. Div.	W. A. Foster		Fitchburg, Mass.
Flint & Pere Marquette	T. J. Hatswell	T. J. Hatswell	E. Saginaw, Mich.
Florida Central	James S. McElroy	James S. McElroy	Jacksonville, Fla.
Flushing, North Shore & Central	Thomas Meehan	|Edward Riley	L. I. City, N. Y.
Fort Wayne & Jackson	C. W. Hollister		Jackson, Mich.
Fort Wayne, Muncie & Cincinnati	Wm. McPhail	Wm. McPhail	Fort Wayne, Ind.

G

Railroad.	*Master-Mechanic.*	*Master Car-Builder.*	*Residence.*
Galv., Harrisburg & San Antonio	D. T. Davis		Harrisburg, Tex.
Galveston, Houston & Henderson	J. G. Conlon		Galveston, Tex.
Geneva, Ithaca & Sayre	J. N. Weaver		Waverly, N. Y.
Geneva, Ithaca & Sayre		E. R. Brown	Packerton, Pa.
Georgia	John S. Cook	T. M. Preval	Augusta, Ga.
Grand Haven	A. S. Parish		Allegan, Mich.
Grand Tower & Carbondale	Hugh Smith	Hugh Smith	Grand Tower, Ill.
Grand Trunk	†Herbert Wallis	Wm. McWood	Montreal, Canada.
Grand Trunk	|Warren Noyes		Gorham, N. H.
Grand Trunk		|Duncan Menish	Portland, Me.
Grand Rapids & Indiana	J. M. Boon		Fort Wayne, Ind.
Grand Rapids & Indiana	|J. R. Fish	|J. R. Fish	Gr'nd Rapids, Mch.
Grayville & Mattoon	C. H. Cory		Mattoon, Ill.
Great Western, of Canada	†C. K. Domville		Hamilton, Can.
Great Western, of Canada	C. F. Hanson	Henry Childs	London, Ont.
Green Bay & Minnesota	|Edw. Osborne		Green Bay, Wis.
Greenville & Columbia	W. J. Parrish		Helena, S. C.
Gulf, Colorado & Santa Fe	Geo. B. Nicols	|W. H. Martin	Galveston, Texas.

H

Railroad.	*Master-Mechanic.*	*Master Car-Builder.*	*Residence.*
Hanover Junction & Gettysburg	John J. Bingley	Henry Britcher	Hanover, Pa.
Hannibal & St. Joseph	Tho. G. Gorman	Tho. G. Gorman	Hannibal, Mo.
Havana, Rantoul & Eastern	J. McCarthy		Rantoul, Ill.
Housatonic	N. Slingland	J. J. Ferris	Falls Village, Conn.
Houston, East & West Texas	J. E. Wiggin		Houston, Tex.
Houston & Texas Central	L. C. Noble	James McGee	Houston, Tex.
Huntingdon & Broad Top	Wm. Barkla		Saxton, Pa.

I

Railroad.	*Master-Mechanic.*	*Master Car-Builder.*	*Residence.*
Illinois Central	**S. J. Hayes	W. B. Snow	Chicago, Ill.
Chicago Division	Henry Schlacks		Chicago, Ill.
South Division	David Oxley		Centralia, Ill.
North Division	J. B. Edams		Amboy, Ill.
Iowa Division	Thomas W. Place		Waterloo, Ia.
Springfield Division	W. B. McKenna		Clinton, Ill.
Illinois Midland	H. H. Osborn		Paris, Ill.
Illinois & St. Louis	J. H. Smith		Belleville, Ill.
Illinois & St. Louis		Charles Rothe	E. St. Louis, Ill.
Indianapolis, Decatur & Springfield	Pulaski Leeds		Indianapolis, Ind.
Indianapolis, Peru & Chicago	John McKenna	John McKenna	Peru, Ind.
Indianapolis & St. Louis	A. J. Sanborn	A. J. Sanborn	Mattoon, Ill.
Indiana, Bloomington & Western	C. A. Thompson	C. A. Thompson	Urbana, Ill.
International & Great Northern	John G. Conlon	|W. H. Martin	Palestine, Tex.

Railroad.	*Master-Mechanic.*	*Master Car-Builder.*	*Residence.*
Intercolonial	†H. A. Whitney	Edw. Shaffer	Moncton, N. B.
Iron	Perry Scott	Clem. Roetling	Ironton, O.
J			
Jacksonville, Pensacola & Mobile	Jas. D. Hollister		Tallahassee, Fla.
Jeffersonville, Mad. & Indianapolis	Wm. Swanston	‖J. D. McIlwain	Jeffersonville, Ind.
Jacksonville, N. West. & S. East	B. J. Miller		Jacksonville, Ill.
Joplin	P. T. Butterly	P. T. Butterly	Girard, Kan.
Junction & Breakwater	J. A. Maguire		Lewes, Del.
K			
Kansas City, Ft. Scott & Gulf	W. D. Rowley		St. Joseph, Mo.
Kansas City, Fort Scott & Gulf	J. S. McCrum	A. N. Montier	Kansas City, Mo.
Kansas City, Lawrence & South'n	J. S. McCrum		Kansas City, Mo.
Kansas City & Eastern	J. H. Burnham	J. H. Burnham	Independence, Mo.
Kan. City, St. Jo. & Coun. Bluff	Wm. D. Rowley	‖Theo. Aylesbury	St. Joseph, Mo.
Kansas Central	Wm. McCall		Leavenworth, Kan.
Kansas Pacific	**John MacKenzie	T. B. Roberts	Armstrong, Kan.
Kaw Valley Division	James Long		Armstrong, Kan.
Smoky Hill Division	John B. Daily		Ellis, Kan.
Denver Division	R. McDougal	‖John Clock	Denver, Col.
Kentucky Central	J. R. Ledyard	J. L. Hackathorn	Covington, Ky.
Knox & Lincoln	E. Bolton	C. L. Turner	Bath, Me.
L			
Lake Erie & Western	¶¶Everett Clemens		Fremont, Ohio.
Lake Erie & Western	¶H. L. Cooper		Lafayette, Ind.
Lake Ontario Southern	Geo. Thompson	Wm. Currier	Sodus Point, N. Y.
Lake Shore & Michigan Southern	‡James Sedgley	††John Kirby	Cleveland, Ohio.
Michigan Southern Division	Geo. W. Stevens		Elkhart, Ind.
" " "		Frank O. Bray	Adrian, Mich.
Toledo Division	J. M. Sanborn	W. O. Smith	Norwalk, Ohio.
Erie Division	L. O. Gassett	J. Withyecombe	Cleveland, Ohio.
Buffalo Division	Edward Studley	A. C. Robson	Buffalo, N. Y.
Lehigh Valley	John I. Kinsey		South Easton, Pa.
Lehigh Valley	P. Hofecker		Weatherly, Pa.
Lehigh Valley	John Campbell		Delano, Pa.
Lehigh Valley	D. Clark		Hazleton, Pa.
Lehigh Valley	A. Mitchell		Wilkesbarre, Pa.
Lehigh Valley		E. R. Brown	Mauch Chunk, Pa.
Little Rock & Fort Smith	James Eblin	James Malone	Argenta, Ark.
Little Rock, Miss. River & Texas	Joseph Taylor	Joseph Taylor	Arkans's City, Ark.
Los Angeles & Independence	Jas. Velsir	‖J. S. Young	Los Angeles, Cal.
Louisville, New Albany & Chicago	Geo. Ruhlandt	Geo. Ruhlandt	New Albany Ind.
Long Island	§Thos. Meehan	Hugh Longest	L. Isl'd City, N. Y.
Louisville, Cincinnati & Lexing'n	A. Schaeffer	A. Schaeffer	Louisville, Ky.
Louisville & Nashville	**Reuben Wells		Louisville, Ky.
Nashville & Decatur Div	W. H. Thomas	J. P. Furguson	Nashville, Tenn.
South & North Ala. Div	C. W. White		Birmingham, Ala.
Memphis & Ohio Div	Thos. Walsh		Memphis, Tenn.
Clarksville Division	Wm. Adair		Bowling Green, Ky.
Ev., Hen. & Nashville Div	W. H. Thomas		Nashville, Tenn.
M			
Macon & Brunswick	R. Wagnon	R. Wagnon	Macon, Ga.
Maine Central	J. W. Philbrick	J. W. Philbrick	Waterville, Me.
Maine Central		C. H. Kenison	Augusta, Me.
Manchester & Lawrence	J. T. Gordon	J. T. Gordon	Concord, N. H.
Manhattan Beach	Lewis James		Bay Ridge, L. I.
Manhattan Elevated	T. W. Peeples		New York, N. Y.
Marietta & Cincinnati	E. M. Bosley	E. M. Bosley	Chillicothe, Ohio.
Marquette, Houghton & Onton'gn	‖W. H. Williams	H. D. Lyons	Marquette, Mich.
Memphis, Paducah & Northern	G. M. Taylor	G. M. Taylor	Paducah, Ky.
Memphis & Little Rock	Tho. Rennell	P. Twitchell	Argenta, Ark.
Memphis & Charleston	§H. N. Burford	J. J. Kasey	Memphis, Tenn.
Michigan Central	S. H. Edgerly		Jackson, Mich.
Michigan Central		††Robert Miller	Detroit, Mich.
Midland of New Jersey	W. C. Ennis		Wortendyke, N. J.
Milwaukee, Lake Shore & West'n	S. Charnly		Manitowoc, Wis.
Minneapolis & St. Louis	Tho. Downing	Tho. Downing	Minneapolis, Minn.
Mineral Point	Robert Hay	Robert Hay	Mineral Pt., Wis.
Mineral Range	George F. Coon		Hancock, Mich.
Mississippi & Tennessee	Geo. Haszinger	S. J. Bolton	Memphis, Tenn.
Missouri & Western	A. C. Persing		Pierce City, Mo
Missouri, Kansas & Texas	H. H. Alexander		Dennison, Texas.
Missouri, Kansas & Texas	**G. W. Cushing	John C. Barber	Sedalia, Mo.
Missouri, Kansas & Texas	Wm. T. Small		Parsons, Kan.
Missouri Pacific	§§John Hewitt	John Hodge	St. Louis, Mo.
Missouri Pacific	R. D. Grant		St. Louis, Mo.
Missouri Pacific	Geo. W. Walshe		Sedalia, Mo.
Missouri Pacific	H. V. Faries		Atchison, Kan.
Mobile & Montgomery	C. W. White	Lewis Barham	Montgomery, Ala.
Mobile & Girard	J. C. Albrecht	A. J. Nix	Columbus, Ga.
Mobile & Ohio	R. H. Briggs	J. T. Booth	Whistler, Ala.
Mobile & Ohio	John Fitzgerald		Macon, Miss.
Mobile & Ohio	M. T. Carson		Jackson, Tenn.
Montgomery & Eufaula	D. M. Gugel	James A. Knight	Macon, Ga.
Morgan's Louisiana & Texas	N. Tilton	Wm. O'Brien	Algiers, La.
N			
Nashua & Lowell	S. A. Davis	S. A. Davis	Nashua, N. H.
Nashville, Chattan'ga & St. Louis	James Cullen	J. G. Sawyer	Nashville, Tenn.
St. Louis Division	L. B. Salisbury	W. H. H. Price	Mt. Vernon, Ill.
Naugatuck	Henry Hanford	George W. Gray	Bridgeport, Ct.
Nebraska	D. Hawksworth		Plattsmouth, Neb.
Nevada Central	J. C. Fisher		Battle Mountain, Nev.
Newburg, Dutchess & Connecticut	W. G. Vanbuskirk		Dutchess J'n, N. Y.
New Brunswick	P. A. Logan	P. A. Logan	Fredericton, N. B.
New Brunswick & Canada	Tho. Armstrong	G. Houlton	St. Andrew's, N. B.
New Haven & Northampton	Henry Fox	John Sweeny	New Haven, Ct.
New Jersey & New York	J. S. Drake		Jersey City, N. J.
New Jersey Southern	Rufus Blodgett		Manchester, N. J.
New Orleans, Texas & Mobile	§Josiah Bettis		Mobile, Ala.
New York, Lake Erie & Western	§§F. M. Wilder		Susquehanna, Pa.
New York, Lake Erie & Western	J. H. Vreeland		Jersey City, N. J.
New York, Lake Erie & Western		‖J. N. Mileham	Jersey City, N. J.
New York, Lake Erie & Western	J. Van Vechten	‖J. Van Vechten	Port Jervis, N. Y.
New York, Lake Erie & Western	V. Blackburn		Susquehanna, Pa.
New York, Lake Erie & Western		‖D. B. Goodell	Elmira, N. Y.
New York, Lake Erie & Western	George H. Griggs		Hornellsville, N. Y.
New York, Lake Erie & Western	Chas. O. Vedder	‖M. Wilder	E. Buffalo, N. Y.
New York, Lake Erie & Western	‖Jos. Bradt		Rochester, N. Y.
New York & Harlem	Theo. Wheeler		New York, N. Y.
New York & Harlem		C. E. Garey	Morrisania, N. Y.
New York Central & Hud. River		††Leander Garey	New York, N. Y.
New York Central Division	§§G. B. Van Vorst	D. Hoit	West Albany, N. Y.
New York Central Division	§§Henry Watkeys		Syracuse, N. Y.
New York Central Division	§§Amos Gould		E. Buffalo, N. Y.
New York Central Division	§§S. L. White	Richard Donaby	Niagara Falls, N. Y.
New York Central Division		E. A. Olmstead	E. Buffalo, N. Y.
Hudson River Division	§§Wm. Buchanan	Peter Smith	New York, N. Y.
New York Central Division		W. B. White	E. Rochester, N. Y.
New York Central Division		Geo. Cummings	Rochester, N. Y.
New York, Ontario & Western	Edw. Minshull		Middletown, N. Y.
New York & New England	§§Geo. E. Boyden	Elias E. Pratt	Boston, Mass.
Norwich & Worcester Div	Richard Colburn	John W. Marden	Norwich, Ct.
Hartford Division	E. M. Humstone	S. Howland	Hartford, Conn.
New York, N. Haven & Hartford	§§H. Kettendorf	James Denver	New Haven, Ct.
Hartford Division	§§Jno. Henney, Jr	L. Packard	Hartford, Ct.
New York, Penn. & Ohio	‡William Fuller	††J. H. F. Wiers	Cleveland, O.
New York, Penn. & Ohio	J. A. Cooper	D. S. Dockstader	Meadville, Pa.
New York, Penn. & Ohio	N. Wright	W. G. Huggard	Cleveland, O.
New York, Penn. & Ohio		S. V. Smith	Kent, O.
New York, Penn. & Ohio	William Hill	J. W. Holmes	Galion, O.
New York, Penn. & Ohio		‖J. T. Fosdick	Salamanca, N. Y
New York, Penn. & Ohio		‖Geo. Wilson	Dayton, O.
Northern Central	§§R. H. Soule	‖G. W. Demarest	Baltimore, Md.
Northern Central	J. M. Coale		Baltimore, Md.
Northern Central	James Strode	‖J. C. Dyott	Elmira, N. Y.
Northern New Hampshire	**Jas. N. Lauder		Concord, N. H.
Northern of Canada	Peter Clark	Peter Clark	Toronto, Can.
Northern Pacific	**A. P. Farrar	A. P. Farrar	Brainerd, Minn.
Dakota Division	A. Rupert		Fargo, Dak.
Pacific & P. Oreille Div	C. Z. Sanders	Tho. G. Davis	New Tacoma, W. T.
Northeastern		W. H. Day	Florence, S. C.
North Pacific Coast	James Walch		Saucelito, Cal.
Northern & Northwestern	C. C. Galt		Toronto, Can.
O			
Ogdensburg & Lake Champlain	Abraham Klohs		Malone, N. Y.
Ohio Central	J. B. Morgan		Bucyrus, O.
Ohio & Mississippi	‡J. F. Sechler		Vincennes, Ind.
Ohio & Mississippi		J. P. Coulter	Aurora, Ind.
Cincinnati Division	John Thumser		Seymour, Ind.
Springfield Division	E. K. Sechler		Pana, Ill.
Old Colony	J. K. Taylor	A. Gleason	Boston, Mass.
B. C. F. & N. Bedford Div	Geo. W. Reynolds	Sam. Stevens	Taunton, Mass.
Oregon & California	§§J. Brandt		Portland, Oregon.
Oregon Railway & Navigation Co	J. F. Curtis	Chas. Phipps	Dalles, Oregon.
P			
Paducah & Elizabethtown	W. D. Robb	W. D. Robb	Elizabethtown, Ky.
Painesville & Youngstown	J. H. Jones		Painesville, O.
Panama	Thos. S. O'Brien		Aspinwall, U. S. C.
Parker & Karns City	Philip Davies	Wm. Wolford	Parker City, Pa.
Pensacola & Selma	R. H. Kelly		Selma, Ala.
Pennsylvania	§§T. N. Ely		Altoona, Pa.
Pennsylvania	H. D. Garrett	I. W. Van Houten	W. Philadelphia, Pa
Pennsylvania	E. L. Caum	Samuel W. Myers	Harrisburg, Pa.
Pennsylvania	G. W. Strattan	John P. Levan	Altoona, Pa.
Pennsylvania	D. O. Shaver	J. G. Stewart	Pittsburg, Pa.
New Jersey Division	L. A. Bosdevex	E. F. Bosdevex	MeadowShops, N. J.
New Jersey Division		David H. Baker	Jersey City, N. J.
New Jersey Division	§§H. S. Hayward		Jersey City, N. J.
New Jersey Division	Tho. Kerr	P. S. Bogart	So. Amboy, N. J.
New Jersey Division	R. McDowell		Lambertville, N. J
New Jersey Division	W. McAllister		Camden, N. J.
West Penn. Division	C. B. Street	M. H. Fails	Blairsville, Pa.
Peoria, Decatur & Evansville	P. Reilly		Pekin, Ill.
Peoria & Jacksonville	R. F. Hurd	R. F. Hurd	Pekin, Ill.
Peoria & Springfield	E. Deizerdt	E. Deizerdt	Peoria, Ill.
Petersburg		J. W. Fleming	Petersburg, Va.
Philadelphia, Wilmington & Balt	S. A. Hodgman	Wm. Lungren	Wilmington, Del.
Philadelphia & Atlantic City	J. W. Wright	E. Lippincott	Camden, N. J.
Philadelphia & Erie	§§Howard Fry		Williamsport, Pa.
	W. F. Beardsley		Sunbury, Pa.
	W. L. Forster		Renovo, Pa.
	W. L. Holman		Kane, Pa.
	W. T. Smith		Erie, Pa.
Philadelphia & Baltimore Central	S. D. Danfield	S. D. Danfield	Chester, Pa.
Philadelphia & Reading	*L. B. Paxson	John H. Rankin	Reading, Pa.
Catawissa Branch	W. H. Ellis	C. D. Ellis	Catawissa, Pa.
Germantown & Norris'n Div	Jackson Richards		Philadelphia, Pa.
North Penn. Division	Jackson Richards	C. W. Hammann	Philadelphia, Pa.
Del. & Bound Brook Div	Jackson Richards		Philadelphia, Pa.
Piedmont Air Line	‡R. D. Wade		Richmond, Va.
Rich. & Danville Div		J. B. Vaughan	Richmond, Va.
North Carolina Div		J. C. Holt	Comp. Shops, N. C.
Pittsburg, Cincinnati & St. Louis	§§G. W. Rhodes		Columbus, O.
Little Miami Division	J. H. Setchel	John McVay	Cincinnati, O.
Little Miami Division		M. P. Ford	Columbus, O.
Col., Cin. & Ind. Division	Robert Curtis	‖Tho. Chamberlin	Columbus, O.
Col., Cin. & Ind. Div	Geo. H. Prescott	‖Chas. H. Starr	Logansport, Ind.
Col. Cin. & Ind. Division	‖C. M. St. Clair		Indianapolis, Ind.
Cin. & Musk. Val. Division	Leroy Kells	‖Daniel Jewell	Lancaster, O
Pitts. Cin. & St. Louis Divis'n	Ross Kells		Denison, O.
Pitts. Cin. & St. Douis Divis'n		‖A. K. Mansfield	Steubenvill, O.
Pittsburg, Fort Wayne & Chicago	Geo. J. Parkin	John Marquis	Allegheny, Pa.
Pittsburg, Fort Wayne & Chicago	J. M. Boon	Israel Lee	Fort Wayne, Ind
Pittsburg, Fort Wayne & Chicago		J. J. Kirkland	Crestline, O.
Pittsburg, Titusville & Buffalo	H. J. Bookhammer	John Monks	Oil City, Pa.
Pittsburg, Virginia & Charleston	Wm. Lininger		Pittsburg, Pa.
Pittsburg & Lake Erie	S. W. Haines		Pittsburg, Pa.
Portland & Ogdensburg	Geo. H. Poor	W. G. Brewer	Portland, Me.
Portland & Rochester	E. H. C. Tompson	David Dow	Portland, Me.
Port Dover & Lake Huron	H. M. Aldrich		Woodstock, Ont.
Port Royal & Augusta	Geo. Riley	J. H. Milton	Port Royal, S. C.
Poughkeepsie, Hartford & Boston	John L. Driscoll		Poughkeepsie, N. Y
Prince Edward Island	A. Stronach	‖D. M. Fraser	Charlottet'n, P. E. I
Providence & Springfield	G. T. Richardson		Pascoag, R. I.
Providence & Worcester	A. Griggs	A. Griggs	Providence, R. I.
Providence, Warren & Bristol	Rufus Smith	Rufus Smith	Bristol, R. I.
Q			
Quebec, Mont., Ottawa & Occidental	†A. Davis		Montreal, Can.
Quincy, Missouri & Pacific			Kirksville, Me.
R			
Raleigh & Augusta Air-Line	**B. R. Harding		Raleigh, N. C.
Raleigh & Gaston	**B. R. Harding	B. R. Harding	Raleigh, N. C.
Rhinebeck & Connecticut	A. W. Quackenbush	John H. Decker	Rondout, N. Y.
Rich., Fredericksburg & Potomac	H. Khun	W. H. Trainham	Richmond, Va.
Richmond & Danville	See Piedmont Air-Line.		
Richmond & Petersburg	John O'Brien	H. L. Carter	Richmond, Va.
Rich., York River & Chesapeake	A. B. Armstrong	A. B. Armstrong	Richmond, Va.
Rio Grande	G. W. Rendall	M. Markwood	Brownsville, Tex.
Rochester & State Line	A. J. Robbins		Rochester, N. Y.
Rock Island & Peoria	Joseph Elder		Peoria, Ill.
Rome, Watertown & Ogdensburg	Geo. H. Hazleleton	Geo. H. Hazelton	Oswego, N. Y.
Rome, Georgia	O. W. Harbin	O. W. Harbin	Rome, Ga.
S			
Saginaw Valley & St. Louis			St. Louis, Mich.
San Francisco & Northern Pacific	Ed. Reynolds	John Martin	Donahue, Cal.
Savannah, Florida & Western	§Charles Collins	P. N. Raynall	Savannah, Ga.
Savannah & Memphis	R. A. Bridges		Opelika, Ala.
Scioto Valley	C. H. Cory	C. H. Cory	Portsmouth, O.
Seaboard & Roanoke	§§M. M. Pendleton		Portsmouth, Va.
Selma, Rome & Dalton	B. J. Sitton	W. W. Pierce	Selma, Ala.
Selma, Marion & Memphis	J. M. Levis		Marion, Ala.
Sheboygan & Fond du Lac	John Hickey	John Hickey	Sheboygan, Wis.
Shenango & Allegheny	Edw. Richardson		Greenville, Pa.
Shepaug	C. M. Allen		Litchfield, Ct.
Sioux City & Pacific	C. H. Foster	C. H. Foster	Missouri Valley, Ia.
Sioux City & St. Paul	F. C. Butterfield	F. C. Butterfield	Shakopee, Minn.
Southern Pacific.			
Northern Division	J. T. Wilson	F. N. Bellisle	San Francisco, Ca
Los Angeles & Yuma Div	Jas. Velsir	‖J. S. Young	Los Angeles, Cal.
Tulare Division	S. Johnson		Tulare, Cal.
South Carolina	§P. J. Cochrane	Geo. H. Gramling	Charleston, S. C.
Southern Central	Chas. G. Brown	H. Mooney	Auburn, N. Y.
Southeastern (Canada)	Edwin Goss		Richford, Vt
Southwestern of Georgia	D. M. Gugel	James A. Knight	Macon, Ga.
South Pacific Coast	Martin Carter	Martin Carter	Newark, Cal.

Railroad.	*Master Mechanic.*	*Master Car-Builder.*	*Residence.*
Spartanburg, Union & Columbia	Wm. Platt	W. B. Brown	Spartanburg, S. C.
Spartanburg & Asheville	M. Fraser	W. B. Brown	Spartanburg, S. C.
Springfield, Athol & Northeastern	W. E. Granger		Springfield, Mass.
Springfield Southern	F. W. Johnstone		Springfield, O.
State Line & Sullivan	J. O. Blight		Towanda, Pa.
Stockton & Copperopolis	John M. Fulton		Stockton, Cal.
Stonington & Providence	J. H. Anderson	J. H. Anderson	Providence, R. I.
St. Croix & Penobscot	G. H. Corsen	H. C. Tincker	Milltown, Me.
St. Johns	Jas. M. Owens		St. Augustine, Fla.
St. Johnsbury & Lake Champlain	Geo. E. Howe		St. Johnsbury, Vt.
S. Joseph & Des Moines	W. D. Rowley		St. Joseph, Mo.
St. Joseph & Western	E. Sleppy	E. Sleppy	So. St. Joseph, Mo
St. Lawrence & Ottawa	Calvin Dame	Calvin Dame	Prescott, Canada.
St. Louis, Iron Mount. & So	**O. A. Haynes	Oscar Doolittle	St. Louis, Mo.
Arkansas Division	L. Finlay	L. Finlay	Little Rock, Ark.
Missouri Division	W. H. Harris		De Soto, Mo.
St. Louis, Alton & Terre Haute	**Beriah Warren		St. Louis, Mo.
St. Louis, Salem & Little Rock	Thomas Everson	A. W. Grosvernor	Steelville, Mo.
St. Louis & San Francisco	M. Kearney		N. Springfield, Mo.
St. Louis, Keokuk & Northwest'n	Wm. Foley		Keokuk, Iowa.
St. Louis Bridge Co. & Tunnel R.R.	H. M. Smith		St. Louis, Mo.
St. Paul & Duluth	W. McFarland	John Hill	St. Paul, Minn.
St. Paul, Minneapolis & Manitoba	J. C. Munro	J. C. Munro	St. Paul, Minn.
St. Paul & Sioux City	F. C. Butterfield	F. C. Butterfield	Shakopee, Minn.
Sussex	E. H. Osborn	R. L. Sutton	Newton, N. J
Syracuse, Binghamton & N. Y	James Buchanan	James Buchanan	Syracuse, N. Y.
Syracuse, Chenango & New York	Geo. W. West		Syracuse, N. Y.
T			
Tennessee & Pacific	William McKeand	William McKeand	Nashville, Tenn.
T. H. & Indianapolis. Vandalia Line.	§§C. R. Peddle	E. D. Carter	Terre Haute, Ind.
Indianapolis Div	Clinton Idler		Indianapolis, Ind
Vandalia Div	Chas. Butler		Effingham, Ill.
Logansport Division	A. J. Prescott	H. L. Clark	Logansport, Ind.
Texas & New Orleans	E. A. Campbell		Houston, Texas.
Texas & Pacific	H. J. Small	‖F. M. Alexander	Marshall, Texas.
Tioga & Elmira State Line	Pere Bonny	D. H. Stratton	Blossburg, Pa.
Toledo, Delphos & Burlington	Geo. H. Tier		Delphos, O.
Toronto, Grey & Bruce	†David Preston		Toronto, Can.
Toronto & Nipissing	J. Haggas		Toronto, Can.
Troy & Boston	Z. B. Davis	R. V. Coon	Troy, N. Y.
U			
Ulster & Delaware	J. B. Dykeman	Jno. H. Decker	Rondout, N. Y.
Union Pacific	§I. H. Congdon	‡‡Geo. E. Stevens	Omaha, Neb.
Eastern Division		‖A. M. Collett	Omaha, Neb.
Eastern Division		‖H. P. Makely	Grand Island, Neb
Mountain Division	T. A. Davis	‖John E. Davis	Cheyenne, Wg. T.
Laramie Division		‖Floyd Heavaner	Laramie, Wg. T.
Western Division		‖R. V. Brinkley	Evanston, Wg. T.
Colorado Division	James S. Scott	E. G. Thomas	Golden, Col.
Utah Central	W. B. Armstrong	Sam. S. Tucker	Salt Lake City.
Utah Western	Robert Anderson		Salt Lake City, U.
Utica & Black River	John Bailey	David James	Utica, N. Y.
Utica, Ithaca & Elmira	Geo. W. Cleveland	F. W. Magargil	Breesport, N. Y.
V			
Valley	Wm. Spittle	Wm. Spittle	Cleveland, O.
Vicksburg & Meridian	Jas. B. Browne		Vicksburg, Miss.
Vicksburg, Shreveport & Pacific	C. H. Tull		Monroe, La.
Virginia & Truckee	I. N. Fording		Carson, Nev.
W			
Wabash, St. Louis & Pacific	Chauncy Morris		Fort Wayne, Ind
Wabash, St. Louis & Pacific	Jacob Johann	‖B. B. Rose	Springfield, Ill.
Wabash, St. Louis & Pacific		U. H. Kohler	Toledo, Ohio.
Wallkill Valley	A. W. Quackenbush	Jno. H. Decker	Rondout, N. Y.
Wash. City, Va. Mid. & G. South	Jas. E. Waddey	J. T. Nalls	Alexandria, Va.
Washington & Ohio	Edward Dunn	John Harrison	Alexandria, Va.
Welland	James Taylor	Wm. H. Pay	St. Catharine, C. W.
Westchester & Philadelphia	John Moyer	Nathan Pawling	Philadelphia, Pa.
Western & Atlantic	John H. Flynn	W. G. Grambling	Atlanta, Ga.
Western Maryland	§David Holtz	J. H. Nussear	Union Bridge, Md.
Western North Carolina	Geo. W. Gates		Salisbury, N. C.
Western, of Alabama	Robert King	F. M. Wade	Montgomery, Ala.
Western R. R. N. C	Isaac W. Clark	Isaac W. Clark	Fayetteville, N. C
Western Union	John Taylor	E. A. Eddy	Racine, Wis.
West Feliciana	J. A. Tilton	Wm. McKelvey	Laurel Hill, La.
West Jersey	W. McAllister	C. C. Williams	Camden, N. J.
White Water	§L. W. Wingert		Harrison, O.
Wilmington, Columbia & Augusta	John Bisset	W. H. Day	Florence, S. C.
Wilmington & Welden	John Bisset	C. R. Clowe	Wilmington, N. C.
Wisconsin Central	A. Tenwick	J. L. Adam	Stevens' P't, Wis.
Worcester & Nashua	John G. Brady	John G. Brady	Worcester, Mass.

Directory of Railway Superintendents and Purchasing Agents

THROUGHOUT THE UNITED STATES AND CANADA.

REFERENCES.—* General Manager. † Managing Director. ‡ Assistant General Superintendent. § Assistant Superintendent. ** Superintendent of Transportation. §§ Assistant General Manager.

Railroad.	*Superintendent.*	*Purchasing Agent.*	*Residence.*
A			
Adirondack	C. E. Durkee		Saratoga, N. Y.
Alabama Central	John M. Bridges		Selma, Ala.
Alabama Great Southern	Chas. P. Ball	R. W. Healey	Chattanooga, Tenn.
Albany & Susquehanna	*C. F. Young		Honesdale, Pa.
Alleghany Valley	David McCargo	David McCargo	Pittsburg, Pa.
Anderson, Lebanon & St. Louis	Jas. A. Larnerd		Anderson, Ind.
Arkansas Midland	*A. H. Johnson		Helena, Ark.
Ashtabula & Pittsburg	D. B. McCoy		Ashtabula, O.
Atchison, Topeka & Santa Fe	*W. B. Strong	F. M. Smith	Topeka, Kan.
Southern Division	A. A. Robinson		Las Vegas, N. M.
Eastern Division	D. J. Chase		Topeka, Kan.
Atchison & Nebraska	*A. E. Touzalin		Omaha, Neb.
Atlanta & Charlotte Air Line	*G. J. Foreacre	G. J. Foreacre	Atlanta, Ga.
Atlanta & West Point	*L. P. Grant		Atlanta, Ga.
Atlantic & North Carolina	A. B. Andrews		Newbern, N. C.
Atlantic, Mississippi & Ohio	Geo. Hoffman	J. P. Minetree	Petersburg, Va.
Atlantic, Tennessee & Ohio	J. J. Gormley		Charlotte, N. C.
B			
Baltimore & Ohio	**W. M. Clements	N. S. Hill	Baltimore, Md.
Ohio & Chicago Division	C. H. Hudson		Chicago, Ill.
Pittsburg Division	G. M. Serpell		Connellsville, Pa.
Baltimore & Potomac	Geo. C. Wilkins	A. W. Sumner	Baltimore, Md.
Bangor & Piscataquis	Arthur Brown		Bangor, Me.
Bath & Hammondsport	M. H. Hall		Hamm'dsp't, N. Y.
Bedford, Sp'gville, Owensb'g & Bd.	Jas. W. Kennedy	Jas. W. Kennedy	Bedford, Ind.
Bellefonte & Snow Shoe	Daniel Rhoads		Bellefonte, Pa.
Bell's Gap	Robert G. Ford		Bellwood, Pa.
Bennington & Rutland	F. C. White	F. C. White	Rutland, Vt.
Blairstown	J. D. Vail		Blairstown, N. J.
Boston, Revere Beach & Lynn	E. H. Whorf		Boston, Mass.
Boston & Albany	*Wm. Bliss		Boston, Mass.
Boston & Albany	C. O. Russell		Springfield, Mass.
Boston & New York Air Line	Jos. H. Franklin		New Haven, Conn.
Boston & Providence	A. A. Folsom	A. A. Folsom	Boston, Mass.
Boston Concord & Montreal	*J. A. Dodge		Plymouth, N. H.
Boston, Concord & Montreal	§W. A. Stowell	J. Thomas Vose	Boston, Mass.
Boston, Hoosac Tunnel & Western	E. B. Burnham		Mechanicsville, N. Y.
Boston & Maine	J. T. Furber	M. E. Wood	Boston, Mass.
Boston & Lowell	A. A. Hobart	F. H. Nourse	Boston, Mass.
Boston, Barre & Gardner	H. M. Witter	H. M. Witter	Worcester, Mass.
Brooklyn, Flatbush & Coney Isl'd.	W. E. Dorwin		Brooklyn, N. Y.
Brunswick & Albany	R. D. Meader		Brunswick, Ga.
Burlington & Mo. River (in Neb.)	*A. E. Touzalin	G. Hargreaves	Omaha, Neb.
Burlington & Mo. River (in Neb.)	Geo. W. Holdrege		Lincoln, Neb.
First Division	J. O. Phillipi		Lincoln, Neb.
Burlington, Cedar Rapids & Nor'n.	C. J. Ives	Rob't Williams	Cedar Rapids, Ia.
Burlington & Northwestern	John F. Gerry	John F. Gerry	Burlington, Ia.
Burlington & Southwestern	J. W. Smith	J. W. Smith	Burlington, Ia.
Buffalo & Southwestern	*John F. Moulton		Buffalo, N. Y.
Buffalo, New York & Philadelphia	Geo. S. Gatchell	J. H. Pool	Buffalo, N. Y.
C			
Cairo & St. Louis	*L. M. Johnson	L. M. Johnson	St. Louis, Mo.
Cairo & Vincennes	Roswell Miller	T. W. Fitch	Cairo, Ill.
California Pacific & Northern	§J. A. Fillmore		Sacramento, Cal.
Camden & Atlantic	F. A. Lister	F. A. Lister	Camden, N. J.
Canada Central	*Archer Baker		Brockville, Can.
Canada Southern	*Wm. P. Taylor	A. F. Howland	St. Thomas, Ont.
U. S. Division	E. P. Murray		Toledo, O.
Canada Division	W. E. Carroll		St. Thomas, Ont.
Canadian Pacific	J. F. Lynskey		Winnepeg, Man.
Carbondale & Shawnestown	R. J. Cavett		Carbondale, Ill.
Carolina Central	V. Q. Johnson	C. H. Roberts	Wilmington, N. C.
Catasauqua & Fogelsville	C. W. Chapman	C. W. Chapman	Catasauqua, Pa.
Cayuga Southern	W. Stevenson		Sayre, Pa.
Cayuga & Susquehanna	W. R. Humphreys		Ithaca, N. Y.
Cazenovia, Canastota & De Ruyter	John Stebbins		Cazenovia, N. Y.
Central Pacific	*A. N. Towne		San Francisco, Cal.
Central Pacific	J. A. Fillmore		San Francisco, Cal.
Central Pacific		J. R. Watson	Sacramento, Cal.
Western & Visalia Divisions	A. D. Wilder		Oakland, Cal.
Truckee Division	Frank Free		Wadsworth, Nev.
Humboldt Division	G. W. Coddington		Carlin, Nev.
Salt Lake Division	A. G. Fell		Ogden, Utah.
Sacramento & Oregon Div	R. H. Pratt		Sacramento, Cal.
Central Vermont	J. W. Hobart		St. Albans, Vt.
Central Vermont	‡J. M. Foss		St. Albans, Vt.
Western Division	John Schrier		Ogdensburg, N. Y.
Central & Southern Division			St. Albans, Vt.
Rutland Division	J. Burdett		Rutland, Vt.
New London Northern	G. W. Bentley	G. W. Bentley	New London, Conn.
Central of Georgia	Wm. Rogers	Henry Yonge	Savannah, Ga.
Atlanta Division	W. F. Shellman		Macon, Ga.
Central of Iowa	D. N. Pickering	D. N. Pickering	Marshalltown, Ia.
Central of New Jersey	James Moore	B. W. Burnet	Elizabeth, N. J.
Central Division	W. W. Stearns		Elizabeth, N. J.
Lehigh & Susq. Division	W. S. Polhemus		Mauch Chunk, Pa.
Champaign, Havana & Western	A. H. Wood		Urbana, Ill.
Charleston & Savannah	C. S. Gadsden		Charleston, S. C.
Charlotte, Columbia & Augusta	Jno. G. Clarke		Columbia, S. C.
Chesapeake & Ohio	W. M. S. Dunn	J. A. Netherland	Richmond, Va.
Cheraw & Darlington	J. F. Divine		Society Hill, S. C.
Cherokee	John Postell		Atlanta, Ga.
Cheshire	R. Stewart	H. H. Stone	Keene, N. H.
Chester & Lenoir	James Mason		Chester, S. C.
Chicago & Northwestern	*Marvin Hughitt	R. W. Hamer	Chicago, Ill.
Chicago & Northwestern	J. S. Oliver		Chicago, Ill.
Chicago & Northwestern	§Chas. C. Wheeler		Chicago, Ill.
Wisconsin & Mill. Division	E. J. Cuyler		Chicago, Ill.
Peninsula Division	W. B. Lindsay		Escanaba, Mich
Madison Division	C. A. Swineford		Baraboo, Wis.
Galena Division	Chas. Murray		Chicago, Ill.
Des Moines & Iowa Division	J. M. Whitman		Clinton, Iowa.
Winona & St. Peter Division	S. Sanborn		Winona, Minn.
Galena & Wisconsin Br	J. B. Trull		Galena, Ill.
Chicago & Alton	J. C. McMullen	A. V. Hartwell	Chicago, Ill.
Chicago & Alton	‡C. H. Chappell		Bloomington, Ill.
Chicago Division	A. M. Richards		Chicago, Ill.
Kansas City St. Louis Div	O. Vaughan		Mexico, Mo.
Chicago & Block Coal	*A. F. Beach		Veedersburg, Ind.
Chicago, Burlington & Quincy	*Thos. J. Potter	Wm. Irving	Chicago, Ill.
Chicago, Burlington & Quincy	§John D. Besler		Galesburg, Ill.
Chicago, Burlington & Quincy	§E. Ryder		Chicago, Ill.
Middle, Galesb'g & Q'y Div	H. Hitchcock		Galesburg, Ill.
St. Louis & R. Isl'd Division	W. R. Crumpton		St. Louis, Mo.
Iowa Division	W. C. Perkins		Burlington, Iowa
Chi., Clinton, Dubuque & Minn	*F. O. Wyatt	F. O. Wyatt	Dubuque, Iowa.
Chicago & Eastern Illinois	O. S. Lyford	O. S. Lyford	Chicago, Ill.
Chicago & Iowa	W. H. Holcomb, *Rec*		Rochelle, Ill.
Chicago & Northeastern	J. M. Turner		Lansing, Mich.
Chicago & Pacific	*J. M. Whitman	James Penny	Chicago, Ill.
Chicago & Paducah	D. H. Conklin		Streator, Ill.
Chicago & Paducah		C. L. Rising	Chicago, Ill.
Chicago, St. Louis & New Orleans	*J. C. Clarke	J. C. Febiger, Jr	New Orleans, La.
South Division	W. P. McKinley		McComb City, Miss.
North Division	J. G. Mann		Jackson, Tenn.
Chicago, Rock Island & Pacific	A. Kimball		Davenport, Iowa.
Chicago, Rock Island & Pacific	‡A. Manvel	A. Manvel	Chicago, Ill.
Southwestern Division	G. F. Walker		Trenton, Mo.
Iowa Division	H. F. Royce		Des Moines, Iowa
Keokuk & Des Moines Div	John Givin		Keokuk, Ia.
Chicago & West Michigan	§C. M. Lawler		St. Joseph, Mich.
Chicago, Milwaukee & St. Paul	W. C. Van Horne	J. T. Crocker	Milwaukee, Wis.
Ch., LaCrosse & P. du C. Div.	H. C. Atkins		Milwaukee, Wis.
Northern Division	L. B. Rock		Milwaukee, Wis.
I. & M., & I. D. Division	C. H. Prior		Minneapolis, Minn.
Wabasha Division	J. H. Lakey		Wabasha, Minn.
Western Union Division	D. A. Olin		Racine, Wis.
Sioux City & Dak. Div	G. E. Merchant		Sioux City, Ia.
Southern Minnesota Div	J. M. Egan	J. M. Egan	La Crosse, Wis.
Chicago, Pekin & Southwestern	A. H. Cook	A. H. Cook	Chicago, Ill.
Chicago, St. Paul & Minneapolis	E. W. Winter		St. Paul, Minn.
Chicago & Grand Trunk	Henry Funnell		Battle Creek, Mich.
Chicago & Grand Trunk		N. Wall	Port Huron, Mich.
Chippewa Falls & Western	L. C. Stanley		Chip'wa F'lls, Wis.
Cincinnati & Eastern	George H. Wilber		Batavia, O.
Cincinnati, Wabash & Michigan	*Norman Beckley	Norman Beckley	Elkhart, Ind.
Cincinnati, Richmond & Chicago	*Lewis Williams		Cincinnati, O.
Cincinnati, Rockp't & Southwest'n	H. C. Branham	H. C. Branham	Rockport, Ind.
Cincinnati & Terre Haute	John Holland		Terre Haute, Ind.
Cin., Cumber'd Gap & Charleston	W. J. Taylor		Knoxville, Tenn.
Cincinnati, Hamilton & Dayton	*Lewis Williams	Lewis Williams	Cincinnati, O.
Cin., Hamilton & Indianapolis	Lewis Williams		Cincinnati, O.
Cincinnati, Lafayette & Chicago	J. W. Sherwood		Cincinnati, Ohio.
Cin., Sandusky & Cleveland	*D. W. C. Brown	Frank Herriman	Sandusky, O.
Cincinnati Southern	Sam'l Woodward	C. M. Woodward	Cincinnati, O.
Cin., Indianapolis, St. Louis & Chi	J. W. Sherwood		Indianapolis, Ind
Cin., Indianapolis, St. Louis & Chi		George Tozzer	Cincinnati, O.
Cleve., Col., Cin. & Indianapolis	*E. B. Thomas	J. L. Yale	Cleveland, O.
Indianapolis Division	C. C. Gale		Indianapolis, Ind
Col. and Cincinnati Divs	Robert Blee		Cleveland, O.
Cleveland & Marietta	S. C. Baldwin	R. B. Hoover	Marietta, Ohio.

Railroad.	*Superintendent.*	*Purchasing Agent.*	*Residence.*
Cleveland & Pittsburg	John Thomas		Cleveland, O.
Cleveland & Pittsburg	*J. D. Layng	Wm. Mullins	Pittsburg, Pa.
Cleveland, Mt. Vernon & Columb's	G. A. Jones		Mt. Vernon, O.
Cleve., Tuscarawas Val. & Wheel.	*Oscar Townsend		Cleveland, O.
Cobourg, Petersboro & Marmora	James R. Barber	J. R. Barber	Cobourg, Ont.
Columbus & Hocking Valley.	Orland Smith		Columbus, O.
Columbus & Toledo	Orland Smith	Geo. R. Carr	Columbus, O.
Columbus & Rome	T. J. Nuckolls		Columbus, Ga.
Concord & Claremont	George E. Todd		Concord, N. H.
Concord	H. E. Chamberlin	H. E. Chamberlin	Concord, N. H.
Concord & Portsmouth	H. E. Chamberlin		Concord, N. H.
Connecticut Central	D. D. Warren, Pres		Springfield, Mass.
Connecticut River	John Mulligan	John Mulligan	Springfield, Mass.
Connecticut Valley	Samuel Babcock		Hartford, Conn.
Connecticut Western	J. F. Jones		Hartford, Conn.
Connecticut & Passumpsic Rivers.	H. E. Folsom		Lyndonville, Vt.
Corning, Cowanesque & Antrim	A. H. Gorton	Andrew Beers.	Corning, N. Y.
Covington, Col. & Black Hills	J. I. Booge		Sioux City, Iowa.
Cumberland Valley	J. F. Boyd	O. N. Lull	Chambersburg, Pa.
Cumberland & Pennsylvania	P. L. Burwell	P. L. Burwell	Cumberland, Md.
Cumberland & Maurice River	L. H. Dowdney		Port Norris, N. J.
D			
Danbury & Norwalk	L. W. Sandiforth		South Norwalk, C.
Danville & Southwestern	James A. Eads		Paris, Ill.
Davenport & Northwestern	D. Flanigan		Davenport, Ill.
Dayton & Michigan	E. E. Dwight		Dayton, O.
Dayton & Union	C. C. Gale		Indianapolis, Ind.
Dayton & Southeastern	J. E. Gimperling, *Rec.*	E. F. Pryor	Dayton, O.
Delaware & Chesapeake	O. S. Sanford		Easton, Md.
Delaware & Hudson Canal Co.	R. Manville	J. White Sprong	Albany, N. Y.
Delaware & Hudson Canal Co.	*C. F. Young		Honesdale, Pa.
Albany & Susq. Division	C. D. Hammond		Albany, N. Y.
Rensselaer & Saratoga Div.	Theo. Voorhees		Troy, N. Y.
Delaware, Lackawanna & Western		G. W. B. Cushing	New York City.
Delaware, Lackawanna & Western	W. F. Hallstead		Scranton, Pa.
Bloomsburg Division	G. Bogart		Scranton, Pa.
Morris & Essex Division	Andrew Reasoner		Hoboken, N. J.
Oswego & Syracuse Division	W. B. Phelps		Oswego, N. Y.
Utica, Chenango & Sus. Div.	W. G. Oakman		Scranton, Pa.
Delaware Western	David Connell		Wilmington, Del.
Denver & Rio Grande	*D. C. Dodge	A. B. Garner	Denver, Col.
Denver, South Park & Pacific	C. W. Fisher	Charles Wheeler	Denver, Col.
Des Moines, Adel & Western	C. N. Gilmore		Adel, Iowa.
Des Moines & Ft. Dodge	C. N. Gilmore	C. N. Gilmore	Des Moines, Ill.
Detroit & Bay City	S. R. Callaway	Allan Bourn	Detroit, Mich.
Detroit, Gr. Haven & Milwaukee	W. J. Morgan	John S. Lorimer.	Detroit, Mich.
Detroit, Hillsdale & Southwestern	W. F. Parker		Ypsilanti, Mich.
Detroit, Lansing & Northern	J. B. Mulliken	Allan Bourn	Detroit, Mich.
Dorchester & Delaware	Tho. E. Wright		Cambridge, Md.
Dunkirk, Allegheny Val. & Pitts	D. Thayer		Dunkirk, N. Y.
Dunkirk, Allegheny Val. & Pitts		C. V. Deforest	New York City.
E			
East Broad Top	A. W. Sims		Orbisonia, Pa.
East Alabama	W. W. Barnes		Opelika, Ala.
East Line & Red River	W. B. Ward		Jefferson, Tex.
East Tenn., Virginia & Georgia	**J. F. O'Brien	J. F. O'Brien	Knoxville, Tenn.
Eastern	**D. W. Sanborn	Geo. J. Fisher	Boston, Mass.
Eastern Kentucky	H. W. Bates	H. W. Bates	Riverton, Ky.
Eastern Kentucky	Geo. Noble		Riverton, Ky.
Eastern Shore	W. Thompson		Prince Anne, Md.
Erie & Pittsburg	J. M. Kimball		Erie, Pa.
Erie & Pittsburg	*J. D. Layng	Wm. Mullins	Pittsburg, Pa.
Eureka & Palisade	P. Evarts		Palisade, Nev.
European & North American	F. W. Cram		Bangor, Maine.
Evansville & Terre Haute	J. E. Martin	Jno. L. White	Evansville, Ind.
Evansville, Terre Haute & Chi	Jos. Collett	W. D. Macfarland	Terra Haute, Ind.
F			
Fitchburg	John Adams	F. S. Pratt	Boston, Mass.
Vermont & Mass. Div	‡E. K. Turner		Fitchburg, Mass
Flint & Pere Marquette	Sanford Keeler	G. C. Cook	E Saginaw, Mich.
Florida Central	W. M. Davidson	W. M. Davidson	Jacksonville, Fla.
Flushing, North Shore & Central	Samuel Spencer	Samuel Spencer	L'g Isl'd C'y, N. Y.
Fonda, Johnstown & Gloversville	L. Caten		Gloversville, N. Y.
Fon du Lac, Amboy & Peoria	A. Kinyon		Fond du Lac, Wis.
Fort Madison & Northwestern	S. B. Kenrick	S. B. Kenrick	Fort Madison, Ia
Fort Wayne & Jackson	M. D. Woodford	M. D. Woodford	Jackson, Mich.
Fort Wayne, Muncie & Cincinnati	W. W. Worthington & P. Ag't.		Fort Wayne, Ind.
Foxburg, St. Petersburg & Clarion	Benj. B. Newton		Foxburg, Pa.
Frankfort & Kokomo	J. B. Clark	E. H. Andress	Lafayette, Ind.
Fredericton	F. B. Edgecombe		Fredericton, N. B.
Freehold & New York	J. E. Ralph		Freehold, N. J.
G			
Gal., Harrisburg & San Antonio	James Converse		Houston, Texas.
Gal., Houston & Henderson	*W. H. Harding	W. H. Harding	Palestine, Texas.
Geneva, Ithaca & Sayre	Wm. Stevenson		Sayre, Pa.
Georgia	S. K. Johnson	S. K. Johnson	Augusta, Ga.
Grand Haven	*F. H. May	F. H. May	Allegan, Mich.
G. Rapids, Newaygo & L. Shore	C. Warner		G. Rapids, Mich.
Grand Rapids & Indiana	W. O. Hughart, Pres't	W. R. Shelby	G. Rapids, Mich.
Northern Division	J. M. Matheany		G. Rapids, Mich.
Southern Division	P. S. O'Rourke		Fort Wayne, Ind.
Grand Trunk	*J. Hickson	John Taylor	Montreal, Canada.
Grand Trunk	W. J. Spicer.		Montreal, Canada.
Grand Tower & Carbondale	T. M. Williamson	Wm. W. Harris	Grand Tower, Ill.
Grayville & Mattoon	*G. L. Bradbury		Mattoon, Ill.
Grayville & Mattoon	G. R. Cobleigh		Mattoon, Ill.
Great Western (Canada)	Charles Stiff		Hamilton, Ont.
Great Western (Canada)		G. R. Nash	London, Ont.
Green Bay & Minnesota	*Timothy Case		Green Bay, Wis.
Greenville & Columbia	J. W. Fry		Columbia, S. C.
Greenville, Col. & Birmingham	E. P. Buell		Greenville, Miss.
Greenwich & Johnsonville	H. H. Warner		Greenwich, N. Y.
Gulf, Colorado & Santa Fé	*John Sealey		Galveston, Texas.
Gulf, Western Texas & Pacific	M. D. Monserrate		Cuero, Texas.
H			
Hamilton & Northwestern	*F. W. Cumberland		Hamilton, Ont.
Hannibal & St. Joseph	W. R. Woodward	T. L. Dunn	Hannibal, Mo.
Hannibal & St. Joseph	W. R. Woodward		Hannibal, Mo.
Eastern Division			Hannibal, Mo.
Western Division	W. C. Alberger		Kansas City, Mo.
Hanover Junction & Gettysburg	Henry A. Young		Hanover, Pa.
Harlem Extension South	*R. C. Root		Bennington, Vt.
Havana, Rantoul & Eastern	H. E. Bullock	H. E. Bullock	Rantoul, Ill.
Housatonic	L. B. Stillson	D. L. Draper	Bridgeport, Conn.
Houston, East & West Texas			Houston, Texas.
Houston & Texas Central	A. H. Swanson	A. H. Swanson	Houston, Texas.
Southern Division	M. G. Howe		Houston, Texas
Northern Division	G. A. Quinlan		Corsicana, Texas.
Huntingdon & Broad Top	Geo. F. Gage	S. B. Knight	Huntingdon, Pa.
I			
Illinois Central	E. T. Jeffrey	O. Ott	Chicago, Ill.
Chicago Division	C. A. Beck		Centralia, Ill.
Northern Division	J. C. Jacobs		Amboy, Ill.
Iowa Division	D. W. Parker		Dubuque, Ia.
Springfield Division	T. J. Hudson		Springfield, Ill.
Illinois Midland	L. Genis, *Rec.*	J. G. Clifford	Terre Haute, Ind.
Illinois & St. Louis	C. H. Sharman		St. Louis, Mo.
Indiana, Bloomington & Western	§§C. E. Henderson	H. C. Norton	Indianapolis, Ind.
Indianapolis, Decatur & Spring.	E. H. Goodrich		Indianapolis, Ind.
Indianapolis & St. Louis	E. B. McClure	H. W. Comstock	Indianapolis, Ind.
Indianapolis, Peru & Chicago	§§E. C. Murphy		Indianapolis, Ind.
Indianapolis, Peru & Chicago		John Mc Kenna	Peru, Ind.
Indianapolis & Vincennes	J. J. Turner		Indianapolis, Ind
Intercolonial	D. Pottinger	L. B. Archibald	Moncton, N. B.
Halifax & St. John Division	Jas. Coleman		Truro, N. S.
Northern Division	M. Busby		Campbellt'n, N. B.
International & Great Northern	*H. M. Hoxie	H. M. Hoxie	Galveston, Texas.
Iowa Eastern	H. H. Kerr		Beulah, Iowa.
J			
Jacksonville, N. Western & S. E.	E. S. Greenleaf		Jacksonville, Ill.
Jacksonville, Pen. & Mobile		J. D. Hollister	Tallahassee, Fla.
Jeff., Madison & Indianapolis	E. W. McKenna		Louisville, Ky.
Jeff., Madison & Indianapolis		Wm. Mullins	Pittsburg, Pa.
Junction & Breakwater	Tho. Groome		Lewes, Del.
K			
Kansas Central	W. A. Martin	W. A. Martin	Leavenworth, Kan.
Kan. City, Burlington & Santa Fe	James Houston		Burlington, Kan.
Kansas City, Fort Scott & Gulf	L. W. Towne	Geo H. Nettleton	Kansas City, Mo.
Kansas City, Lawrence & South	L. W. Towne	Geo. H. Nettleton	Kansas City, Mo.
Kan. City, St. Joseph & C. Bluffs	J. F. Barnard		St. Joseph, Mo.
Kan. City, St. Joseph & C. Bluffs			Kansas City, Mo.
Kansas City & Eastern	H. Hale		Independence, Mo
Kansas Pacific	*S. H. H. Clark	A. D. Clark	Omaha, Neb.
Kansas Pacific	S. T. Smith		Kansas City, Mo.
Kaw Valley Division	J. O. Brinkerhoff		Kansas City, Mo.
Smoky Hill Division	J. T. Odell		Ellis, Kansas.
Denver Division	J. T. Odell		Denver, Col.
Cheyenne Division	A. A. Egbert		Denver, Col.
Kent Co. & Smyrna & Del. Bay	J. F. Bingham		Chestertown, Md.
Kentucky Central	J. R. Ledyard		Covington, Ky.
Kingston & Pembroke	B. W. Folger	Wm. Harty	Kingston, Can.
Knox & Lincoln	C. A. Coombs	C. A. Coombs	Bath, Maine.
Knoxville & Ohio	G. J. Kinzel		Knoxville Tenn.
L			
Lake Erie & Western	*E. H. Waldron	E. H. Andress	Lafayette, Ind.
Sandusky Division	D. S. Hill		Fremont, Ohio.
Bloomington Division	M. Clark		Lafayette, Ind.
Lake Ontario Southern	*Jas. E. Briggs		Newark, N. Y.
Lake Shore & Mich. Southern	*John Newell		Cleveland, Onio.
Lake Shore & Mich. Southern	Charles Paine	A. C. Armstrong	Cleveland, Ohio.
Buffalo & Erie Division	C. B. Couch		Clevelahd, Ohio.
Toledo Division	Thos. Flesher, Jr		Cleveland, Ohio.
Michigan Division	J. E. Curtis		Toledo, Ohio.
Detroit Division	P. S. Blodgett		Detroit, Mich.
Western Division	J. H. Parsons		Chicago, Ill.
Lansing Division	T. J. Charlesworth		Lansing, Mich.
Franklin Division	Geo. H. McIntire		Stoneboro, Pa.
Lehigh Valley	Robert H. Sayre		Bethlehem, Pa.
Lehigh Valley		L. Chamberlin	Philadelphia, Pa.
Beaver Meadow Division	A. G. Brodhead, Jr		Mauch Chunk, Pa
Mahanoy Division	James I. Blakslee		Mauch Chunk, Pa.
New Jersey Division	H. E. Packer		Metuchen, N. J.
Wyoming Division	A. Mitchell		Wilkesbarre, Pa.
Levis & Kennebec	W. C. Hall		Quebec, Can.
Ligonier Valley	Thos. A. Mellon		East Liberty, Pa.
Little Rock & Fort Smith	T. Hartman		Little Rock, Ark.
Little Rock, Miss. River & Texas	J. A. Woodson	J. A. Woodson	Pine Bluff, Ark.
Los Angeles & Independence	§W. J. L. Moulton		Los Angeles, Cal.
Long Island	T. R. Sharp, Rec	R. M. Galloway	L'g Isla'd C'y, N. Y
Louisville & Nashville	*F. de Funiak		Louisville, Ky.
Louisville & Nashville	D. W. C. Rowland	G. C. Breed	Louisville, Ky.
St. L. & S. E. & N. & D. Div.	James Montgomery		St. Louis, Mo.
Memphis Line	J. T. Harrahon		Memphis, Tenn.
Nashville & Decatur Div	James Geddes		Nashville, Tenn.
So. & North Ala. Division	B. Dunham		Birmingham, Ala.
Louisville, Cincinnati & Lexington	Wm. Mahl	Wm. Mahl	Louisville, Ky.
Louisville, New Albany & Chicago	J. MacLeod	Wm. M. Lewis	Louisville, Ky.
Louisville, N. Albany & St. Louis	H. L. Shepherd		New Albany, Ind.
M			
Macon & Brunswick	Jas. M. Edwards	W. C. Jones	Macon, Ga.
Maine Central	Payson Tucker		Portland, Me.
Manchester & Lawrence	H. E. Chamberlin		Concord, N. H.
Manchester & North Weare	H. E. Chamberlin		Concord, N. H.
Manhattan Beach	A. Corbin, *Pres't*		New York, N. Y.
Manhattan Elevated	§§Frank K. Hain		New York, N. Y.
Eastern Division	Robert Stewart		New York, N. Y.
Western Division	T. T. Onderdonk		New York, N. Y.
Marietta & Cincinnati	Jas. H. Stewart.	J. H. Stewart	Cincinnati, O.
Marquette, Hought'n & Ontonag'n	*Samuel Schoch		Marquette, Mich.
McKean & Buffalo	S. V. Godden		Smethport, Pa.
Memphis & Little Rock	*Jas. Harrington		Memphis, Tenn.
Memphis & Little Rock	E. K. Sibley		Memphis, Tenn.
Memphis & Charleston	John A. Grant	John A. Grant	Huntsville, Ala.
Memphis, Paducah & Northern	*N. Monsarrat	N. Monserrat	Paducah, Ky.
Michigan Air Line	*M. S. Hadley		Romeo, Mich.
Michigan Central	*H. B. Ledyard	Allan Bourn	Detroit, Mich.
Michigan Central	‡E. C. Brown		Jackson, Mich.
Mackinaw & Saginaw Div	W. A. Vaughan		Bay City, Mich.
Main L'e & G. R. & Kal. Div's	C. B. Bush		Jackson, Mich.
Middleburg & Schoharie	P. S. Demforth		Middleburg, N. Y.
Middletown & Crawford	D. Thompson		[Thompson, Ridge, N. Y
Midland of New Jersey	*H. M. Britton		Jersey City, N. J.
Midland Railway of Canada	H. G. Taylor		Port Hope, Ont.
Milwaukee, Lake Shore & West'n	H. G. H. Reed		Milwaukee, Wis.
Mineral Point	G. W. Cobb	G. W. Cobb	Mineral Point, Wis.
Mineral Range	*C. E. Holland		Hancock, Mich.
Minneapolis & St. Louis	*Chas. F. Hatch	Chas. F. Hatch	Minneapolis, Minn
Minnesota Midland	J. H. Lakey		Wabasha, Minn.
Mississippi & Tennessee	M. Burke	M. Burke	Memphis, Tenn.
Missouri, Kansas & Texas	*Abram Mitchell	G. M. Babcock	Sedalia, Mo.
Sedalia, Ft. S., & Neosho Div.	L. Pearson		Sedalia, Mo.
Cherokee & Choctaw Div	E. Harding		Denison, Tex.
Missouri Division	Geo. H. Huntington		Hannibal, Mo.
Fort Scott Division	L. Pearson		Sedalia, Mo.
Missouri Pacific	A. A. Talmage	R. B. Lyle	St. Louis, Mo.
Missouri Pacific	‡A. W. Dickinson		St. Louis, Mo.
Eastern Division	Miller Bullard		St. Louis, Mo.
Central Branch Division	W. W. Fagan		St. Louis, Mo.
Western Division	Warder Cumming		Sedalia, Mo.
Mobile & Alabama Grand Trunk	F. B. Clark, Prest		Mobile, Ala.
Mobile & Ohio	*A. L. Rives	A. L. Rives	Mobile, Ala.
Northern Division	E. S. Hosford		Jackson, Tenn.
Southern Division	C. Fleming		Mobile, Ala.
Mobile & Girard	W. L. Clark		Columbus, Ga.
Mobile & Montgomery	B. Dunham		Montgomery, Ala.
Mont Alto	G. B. Weistling		Mont Alto, Pa.
Montgomery & Eufaula	W. G. Raoul		Macon, Ga.

Railroad.	*Superintendent.*	*Purchasing Agent.*	*Residence.*
Montpelier & Wells River	W. A. Stowell		Montpelier, Vt.
Montrose	J. I. Blakslee	J. I. Blakeslee	Mauch Chunk, Pa
Morgan's Louisiana & Texas	Geo. Pandeley	C. A. Whitney & Co.	New Orleans, La.
Muncy Creek	H. R. Mehrling		Hughesville, Pa.
N			
Nashua, Acton & Boston	H. E. Chamberlin		Concord, N. H
Nashua & Lowell	Chas. E. Paige	Chas. E. Paige	Nashua, N. H.
Nashville, Chattanooga & St. Louis	J. C. Wrenne		Nashville, Tenn.
Natchez, Jackson & Columbus	J. H. Fitzpatrick		Natchez, Miss.
Naugatuck	Geo. W. Beach	Geo. W. Beach	Waterbury, Conn.
Nebraska	Wm. Irving		Omaha, Neb.
Nevada Central	*Jos. Collett		Battle Mountain, Nev.
Newburg, Dutchess & Connecticut	C. L. Kimball	C. L. Kimball	Dutchess J'n, N.Y.
New Brunswick & Canada	John Stewart		St. Stephen, N. B.
New Brunswick	Tho. Hoben	T. Burpee	Gibson, N. B.
New Canaan	Wm. St. John		New Canaan, Conn.
New Castle & Franklin	A. Vandivort		New Castle, Pa.
New Haven & Derby	E. S. Quintard		New Haven, Conn.
New Haven & Northampton	C. N. Yeamans	C. N. Yeamans	New Haven, Conn.
New Jersey & New York	J. D. Hasbrouck		Jersey City, N. J.
New Jersey Southern	Rufus Blodgett		119 Lib. st., N. Y.
New Orleans & Selma	T. H. Du Puy		Selma, Ala.
New Orleans, Texas & Mobile	D. B. Robinson	John J. Howell	New Orleans, La.
New York, Lake Erie & Western	*Robert Harris		New York, N. Y.
New York, Lake Erie & Western	E. S. Bowen	J. A. Hardenbergh	New York, N. Y.
New York, Lake Erie & Western	‡O. Chanute		New York, N. Y.
New York, Lake Erie & Western	**P. P. Wright		Jersey City, N. J.
Eastern Division	E. O. Hill		Port Jervis, N. Y.
Delaware Division	Benj. Thomas		Port Jervis, N. Y.
Susquehanna Division	R. B. Cable		Elmira, N. Y.
Buffalo & Rochester Div	R. G. Taylor		Buffalo, N. Y.
Western Division	J. S. Beggs		Dunkirk, N. Y.
New York & Greenwood Lake	†Wm. P. Harris		Jersey City, N. J.
New York, New Haven & Hartford	*E. M. Reed	R. N. Dowd	New Haven, Conn.
N. Y. & N. H. Division	John T. Moody		New York, N. Y.
Hartford Division	C. S. Davidson		Hartford, Conn.
Shore Line Division	W. H. Stevenson		New Haven, Conn.
New York Central & Hudson Riv			
Hudson River & Harlem Div	J. M. Toucey	C. V. DeForest	New York, N. Y.
Eastern Division	Zenas C. Priest		Utica, N. Y.
Western Division	Geo. H. Burrows		Rochester, N. Y.
New York Central Division	Jas. Tillinghast		Albany, N. Y.
New York & Harlem	Chas. M. Bissell	R. C. Moore	New York, N. Y.
New York & New England	*Jas. H. Wilson	W. W. McKim	Boston, Mass.
Eastern Division			Boston, Mass.
Norwich Division	P. St. M. Andrews		Norwich, Conn.
Western Division	J. T. McManus		Hartford, Conn.
New York, Ontario & Western	*Theo. Houston		New York, N. Y.
New York, Ontario & Western	N. R. Hankin	Charles Clark	Middletown, N. Y.
Northern Division	C. W. Lanpher		Norwich, N. Y.
Southern Division	A. H. Danforth		Middletown, N. Y.
New York, Penn. & Ohio	P. D. Cooper	J. H. Holway	Cleveland, O.
First & Second Divisions	A. L. Dunbar		Meadville, Pa.
Third and Fourth Divisions	T. A. Phillips		Galion, O.
Mahoning Division	J. M. Ferris		Cleveland, O.
Northern Pacific	*H. E. Sargent	E. T. Williams	St. Paul, Minn.
Northern Pacific	H. A. Towne		Brainerd, Minn.
Pacific & P. Oreille Div	J. W. Sprague	J. W. Sprague	New Tacoma, W. T.
Missouri Division	D. R. Taylor		Mandon, Dak.
Northern of Canada	*F. W. Cumberland		Toronto, Can.
North Carolina	See Piedmont Air-Line.		
Northern Central	*Frank Thomson		Philadelphia, Pa.
Northern Central		A. W. Sumner	Baltimore, Md.
Baltimore Division	G. C. Wilkins		Baltimore, Md.
Elmira & Canandaigua Div	R. Neilson		Elmira, N. Y.
Susquehanna Division	W. A. Baldwin		Williamsport, Pa.
Northern (New Hampshire)	George F. Todd		Concord, N. H.
Northeastern (Georgia)	Lyman Wells		Athens, Ga.
Northeastern (South Carolina)	J. F. Devine		Charleston, S. C.
North Pacific Coast	*John W. Doherty	W. F. Russell	San Francisco, Cal.
Northwestern Ohio	J. S. Morris		Toledo, O.
Northern & Northwestern	Jas. Webster		Toronto, Can.
O			
Ogdensburg & Lake Champlain	W. W. Hungerford		Ogdensburg, N. Y.
Ohio Central	G. G. Hadley		Columbus, O.
Ohio & Mississippi	W. W. Peabody		Cincinnati, O.
Ohio & Mississippi		G. E. Atwood	St. Louis, Mo.
Eastern Division	C. B. Cole		Seymour, Ind.
Western Division	C. M. Stanton		St. Louis, Mo.
Louisville Division	C. Cole		Louisville, Ky.
Ohio & Toledo	N. A. Smith		Carrollton, O.
Old Colony	J. R. Kendrick	F. P. Moseley	Boston, Mass.
Northern Division	§S. A. Webber		Fitchburg, Mass.
Cape Cod Division	§C. H. Nye		Hyannis, Mass.
Main Line Division	§J. H. French		Boston, Mass.
Olean, Bradford & Warren	J. W. Watson		Oleon, N. Y.
Omaha & Republican Valley	P. J. Nichols		Omaha, Neb.
Omaha & Northern Nebraska	J. E. House		Omaha, Neb.
Oregon & California	J. Brandt, Jr	J. Brandt, Jr	Portland, Oregon.
Oregon Railway & Navigation Co.	G. J. Ainsworth		Portland, Oregon.
Owensboro & Nashville	E. Culverhouse		Owensboro, Ky.
P			
Paducah & Elizabethtown	Robert Meek		Elizabethtown, Ky.
Painesville & Youngstown	**J. A. Newcome		Youngstown, O.
Parker & Karns City	W. C. Moberly		Parker City, Pa.
Peach Bottom	S. M. Manifold		York, Pa.
Paw Paw & Toledo & South Haven	John Ihing		Lawton, Mich.
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Pennsylvania	Charles E. Pugh		Altoona, Pa.
Pennsylvania	**John Reilly		Altoona, Pa.
New York Division	James McCrea		Jersey City, N. J.
Amboy Division	I. S. Buckelew		Camden, N. J.
Belvidere Division	J. A. Anderson		Lambertville, N. J.
New Jersey Division	F. Wolcott Jackson		Jersey City, N. J.
Philadelphia Division	W. F. Lockard		Philadelphia, Pa.
Middle Division	S. M. Prevost		Harrisburg, Pa.
Pittsburg Division	Robert Pitcairn		Pittsburg, Pa.
Tyrone Division	S. S. Blair		Tyrone, Pa.
Bedford Division	Tho. A. Roberts		Harrisburg, Pa.
West Pennsylvania Division	E. B. Taylor		Allegheny City, Pa.
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Pensacola & Selma	W. D. Chipley		Pensacola, Fla.
Peoria, Decatur & Evansville	G. R. Cobleigh	G. R. Cobleigh	Pekin, Ill.
Peoria & Jacksonville	*Geo. Skinner	Geo. Skinner	Peoria, Ill.
Peoria & Springfield	J. R. Hilliard		Peoria, Ill.
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Philadelphia & Baltimore Central	Henry Wood	Henry Wood	Philadelphia, Pa.
Philadelphia & Erie	Wm. A. Baldwin		Williamsport, Pa.
Philadelphia & Erie		Enoch Lewis	Philadelphia, Pa.
Western Division	J. W. Reynolds		Erie, Pa.
Middle Division	E. B. Westfall		Renovo, Pa.
Eastern Division	Thomas Gucker		Williamsport, Pa.
Danv., Haz. & W. Barre Div	Joseph Crawford		Sunbury, Pa.
Philadelphia, Wilmington & Balt.	H. F. Kenney		Philadelphia, Pa.
Philadelphia, Newt'n & New York	L. L. Bush		Philadelphia, Pa.
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Providence & Worcester	W. E. Chamberlain		Providence, R. I.
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Raleigh & Gaston	J. C. Winder		Raleigh, N. C.
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Richmond & Danville	(See Piedmont Air-Line).		
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Rock Island & Peoria	R. R. Cable	R. R. Cable	Rock Island, Ill.
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St. Joseph & Western		A. D. Clarke	Omaha, Neb.
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Missouri Division	Wm. Kerrigan		St. Louis, Mo.
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Southern Central	Jas. G. Knapp		Auburn, N. Y.
South Mountain	W. H. Woodward		Pine Grove Furnace, Pa.
Southern Pacific	A. C. Bassett	John R. Watson	San Francisco, Cal.
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Tulare Division			Oakland, Cal.
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Southwestern of Georgia	W. G. Raoul		Macon, Ga.
Southwestern of Kentucky	M. Tabler		Harrodsburg, Ky.
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Spartanburg & Asheville	Jas. Anderson	Jas. Anderson	Spartanburg, S. C.
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Springfield & Northwestern	E. B. Hyde	E. B. Hyde	Springfield, Ill.
Springfield Southern	Wm. Thornburg	G. A. Barnes	Springfield, O.
Springfield & Western Missouri	T. F. Oakes		Kansas City, Mo.
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Stonington & Providence		Giles F. Ward	Stonington, Conn.
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Terre Haute & Ind'apolis } -dalia	Joshua Staples		Indianapolis, Ind.
Terre Haute & Ind'apolis } Line.		C. R. Peddle	Terre Haute, Ind.
Logansport Division			Logansport, Ind.
Terre Haute & Southeastern	George Atherton		Terre Haute, Ind.
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Texas & Pacific	Geo Noble	Geo. Noble	Marshall, Tex.
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Southern Division	C. Harris		Marshall, Tex.
Texas Western	J. W. Goodwin		Houston, Tex.
Texas & St. Louis	C. F. Stephens		Tyler, Tex.
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Toledo, Delphos & Burlington	I. H. Burgoon		Delphos, O.
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Toledo & Ann Arbor	J. S. Morris		Ann Arbor, Mich.
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Toronto & Nipissing	John Duncan	John Symons	Toronto, Can.
Tuckerton	J. J. Pharo	J. C. Ridgeway	Tuckerton, N. J.
U			
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Union Pacific	§Jas. T. Clarke		Omaha, Neb.
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Mountain Division	Robert Law		Cheyenne, Wy. T.
Laramie Division	Edw. Dickinson		Laramie, Wy. T.
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Vicksburg & Meridian	E. F. Raworth	E. F. Raworth	Vicksburg, Miss.
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Virginia & Truckee	H. M. Yerington	C. P. Mason	Carson, Nev.
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Ohio & Indiana Division	K. H. Wade		Fort Wayne, Ind.
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Council Bluffs & Omaha Div	J. W. Blanchard		Stanberry, Mo.
Peoria & Iowa Division	W. F. Merrill		Peoria, Ill.
Wabash, Chester & Western	J. L. Hinkley		Chester, Ill.
Wallkill Valley	J. H. Jones		Rondout, N. Y.
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Westchester & Philadelphia	Henry Wood	Henry Wood	Philadelphia, Pa.
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West Jersey	W. J. Sewell		Camden, N. J.
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Western North Carolina	A. B. Andrews		Asheville, N. C.
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So. Mid. & Northern.	G. Campbell		Steven's Point, Wis.
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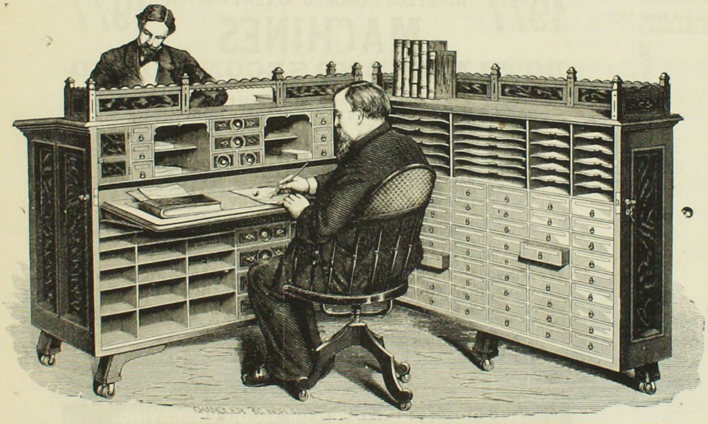

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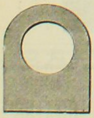

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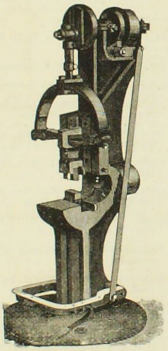

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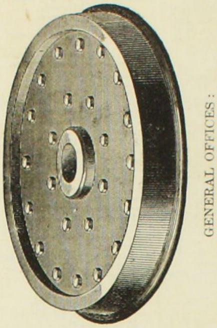

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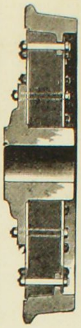

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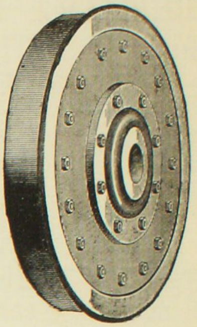

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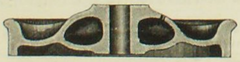

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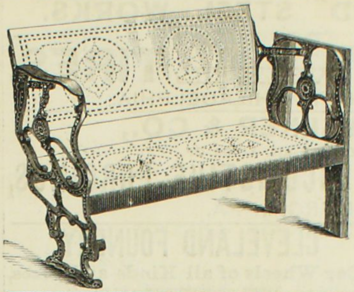

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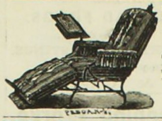

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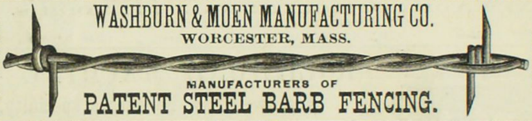

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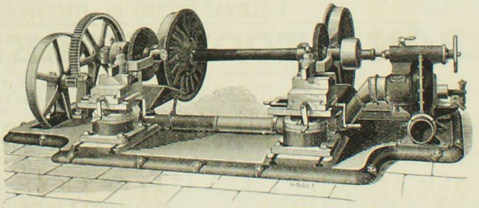

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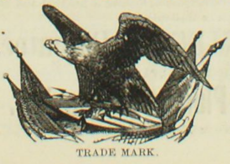

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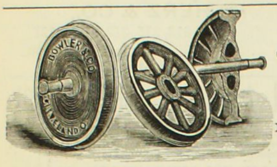

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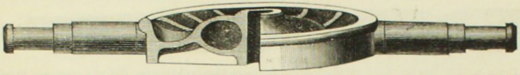

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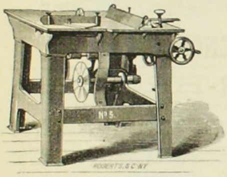

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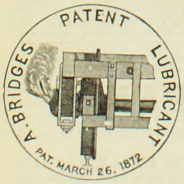

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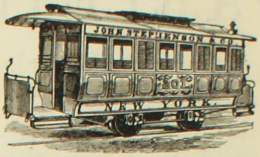

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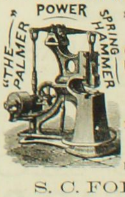

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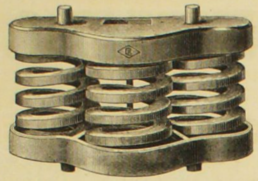

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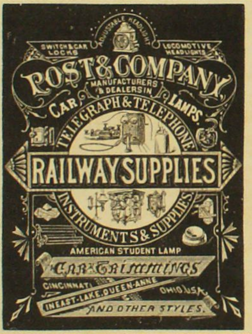

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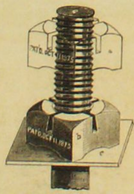

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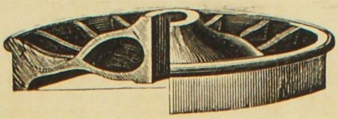

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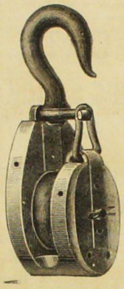

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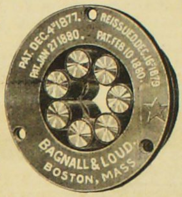
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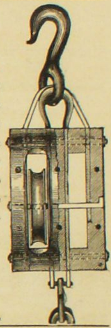

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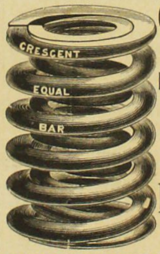

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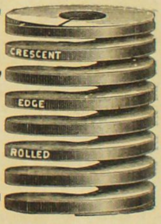

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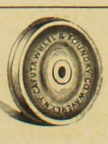
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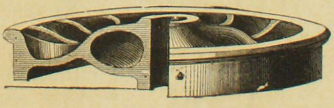

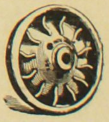

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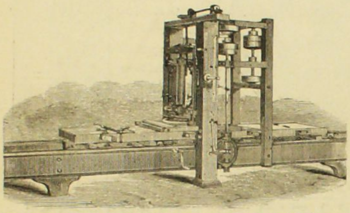

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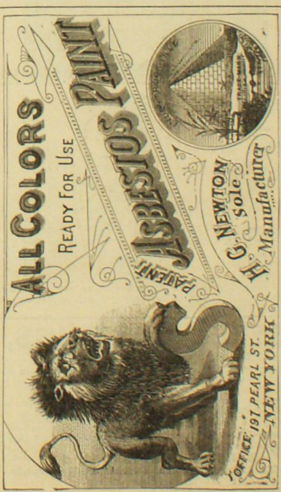
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